The IRS Research Bulletin

1993/1994

National Office Compliance Research

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FOREWORD

Since 1985, ***The IRS Research Bulletin*** (formally ***Trend Analyses and Related Statistics***) has provided analytical and statistical information on significant trends and major IRS research findings relating to tax administration. Our key internal customers are those IRS executives, managers and staff with major responsibilities in understanding and improving the way we do business--particularly in the area of compliance. Our primary external customers include policy makers, researchers, and practitioners who seek to shape a more efficient and equitable tax system.

The 1993/1994 edition continues this tradition of the ***Bulletin*** as a vehicle for showcasing major research results and includes several customer-suggested improvements. In 1993, we took a production sabbatical from the ***Bulletin*** for a quality review. We interviewed numerous IRS executives, contacted prior authors and conducted a survey of our internal customers to determine the future direction of the ***Bulletin***. An overwhelming majority of those participating in our review expressed great satisfaction with the ***Bulletin***. Some also offered suggestions for possible enhancements. These included contributions from the IRS field offices; indexes for the articles and abstracts published in past ***Bulletins***; the trends highlight section organized by topic using an index format; more extensive coordination of articles with affected IRS functions prior to publication; and expanded statistical tables that include industry-specific data. We are also internally marketing the ***Bulletin*** to a wider audience through vehicles such as ***The IRS Research Bulletin Preview***. The ***Preview*** is a three-page summary of the entire ***Bulletin***.

The trends, research findings and other information presented in this publication provide valuable insights tied directly to IRS' business vision and strategic objectives. Among the articles in this edition are compliance analyses that examine the results of the 1988 individual taxpayer compliance measurement program (TCMP) and provide new measures for noncompliance; a report on a Compliance 2000 prototype focusing on the Alaska commercial fishing industry; and a summary of the Voluntary Compliance Index (VCI) computer system used to profile local market segments. Other articles address customer service and burden reduction efforts. Among these are reports on the TeleFile program, the mechanics of a public service campaign, forms usage and distribution patterns, and a process analysis effort focused on installment agreements. Additional articles are focused on productivity and employee development such as an analysis of the independent contractor versus employee classification issue and a new artificial intelligence application to assist IRS staff in making those determinations; an overview of the Executive Management Support System (EMSS); and a report on the results of a survey of Automated Collection System (ACS) employees.

The IRS Research Bulletin has a Servicewide focus and should be of interest to all IRS employees engaged in systematic efforts to understand and redesign the organization to serve the public better. The information presented in this publication addresses matters such as training, diversity, compliance, customer service, computer technology, and economic and demographic trends. The ***Bulletin*** should be a particularly useful reference for the new District Office Research and Analysis (DORA) staff involved in profiling market segments and identifying emerging issues.

We hope you find this edition of the ***Bulletin*** insightful and thought-provoking. As always, we welcome your comments and suggestions and invite internal users to respond to the customer survey included in this edition.

Wayne Thomas
National Director, Compliance Research

IRS employees tell us what you think...
Internal Customer Survey -- 1993/1994 Edition

We ask IRS employees to take a few moments to answer the following questions concerning this edition of ***The IRS Research Bulletin.*** Your responses will enable us to better meet the needs of our customers. Thank you for your cooperation.

1. What section(s) of ***The IRS Research Bulletin*** interests you particularly? Why?

   __ Trends '94 __ Articles __ Abstracts __ Statistical Tables __ Index __ Preview (sent separately)

   _____

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   _____
   _____

3. How would you describe the usability of the text?
   __ Too technical
   __ Not detailed enough
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Trends '94

by Nichole Kamman and David Browne

Introduction

As we approach the 21st century, we note several trends taking shape now which give us an indication of things to come. Monitoring and then responding to a trend, which is the movement of events in one direction or another, enables an organization to achieve its objectives. For the IRS, this means looking at those factors that could potentially affect its objectives of increasing voluntary compliance, maximizing customer service and reducing burden, and achieving quality-driven productivity through systems improvement and employee development.

Issues Still Current

Not surprisingly, the trends identified in "Trends '92" (***The IRS Research Bulletin***, 1992) are still with us. American society continues to become more diverse and the current and near-future labor force reflects that. The economy continues its globalization and parallel growth in the small business sector, and the pace and intensity of technological change increases unabated. There are some changes, however, since our last summary:

- Illiteracy is becoming increasingly prevalent. Over 40 million adults in the United States have only basic reading and writing skills; 50 million cannot use a calculator for basic addition.

- The rate of bankruptcies, business failures, borrowing, and indebtedness is slowing. Pension funds continue to be underfunded, however.

- Violence has spilled over into the work place with homicide now the leading cause of death in the work place.

The common reaction when reading about trends is "so what?" Most readers find trend analysis interesting but have problems finding its applicability to their daily work. With that in mind, we suggest answering the questions below as a way of making the connection. For example, think of the issue of literacy and answer the following:

Questions to Ponder

1. *Has this issue changed direction, speed, intensity, or volume in the past year?*
2. *Is this an issue that may continue to be important for the remainder of the decade? Or is it one that is more temporary?*
3. *Is this an issue over which the IRS has any influence?*
4. *How does this issue affect voluntary compliance, taxpayer burden, and IRS productivity and customer satisfaction?*
5. *Does this issue offer the IRS any opportunities or benefits? What obstacles or barriers might arise from this issue?*
6. *Are there currently any programs in place in the IRS that address this issue?*
7. *Is this an issue that is more regional than national?*
8. *How does this issue affect the employees that I manage?*

With these questions and the following trends in mind, readers can develop and strengthen IRS strategies to offer quality service to the taxpaying public, increase voluntary compliance, and improve workplace productivity.

In the following pages, we offer a sample of various trends presented in an index style (i.e., general topic listed on the left side of page). This format allows the reader to make connections between the various components which are personally relevant. For example, readers interested in trends affecting their work place might consider the Employment, Equal Employment Opportunity, Caregiving, and Work-Related Stress entries.

Aging and Retirement

American longevity continues to lag behind many other industrialized nations. U.S. life expectancy at birth has risen steadily this century to 75.4 years in 1990, from 73.7 in 1980 and 47.3 in 1900. But the U.S. still ranks 11th out of 15 countries with traditionally low mortality. Japan had the highest life expectancy at birth (78.9 years), followed by Iceland (78.0), Sweden (77.6) and Switzerland (77.4). Similar patterns also exist when ranking men and women separately.
(The Wall Street Journal, August 19, 1992)

Baby boomers will be better off in retirement than their parents were. A recent study indicates that past comparisons of male earnings or family income, which have indicated baby boomers are not doing as well as their parents did, do not take into account generational life-style differences. For example, boomers have delayed marriage or not married at all, they have fewer or no kids, and often both spouses work. Taking these factors into account, boomers are about two-thirds better off than their parents were at the same ages.
(The Wall Street Journal, May 25, 1993)

The male-female pension coverage gap is greatest among older workers, but the coverage gap is closing faster than the wage disparity between the sexes. Women's coverage is limited by their working experience: they earn less, change jobs more often, quit and come back more often, and work more in groups that lack retirement benefits. Women were nearly half the nonfarm work force in 1991, yet only 39.7 percent of these women were covered by pension plans, up from 36.7 percent in 1988. For men, 47 percent had retirement coverage.
(The Wall Street Journal, July 13, 1993)

Elderly couples in the U.S. are much better off than aged single women. In the mid-1980s, married couples aged 65 and over were, on average, the most affluent relative to their countrymen, with a median income almost 10 percent above the U.S. family median. Older single women, by comparison, had a median income almost 40 percent below the national family median. Relative to other countries, the U.S. has the highest proportion of old people with incomes below the poverty level.
(The Wall Street Journal, July 20, 1993)

Bankruptcy

See Financial Stress

Business Finances

Employers severely cut desk space, resume-writing services and outplacement counseling provided to fired executives, according to recent study. The percentage of companies providing desk space fell to 15 percent last year from 25 percent in 1991. However, nearly two-thirds of these firms are providing health benefits to fired workers, up from 41 percent in 1991.
(The Wall Street Journal, January 4, 1994)

Business Finances (cont.)

Despite a general economic slowdown in 1991, revenue for the Nation's health services industries continued to climb, increasing 10 percent over 1990 levels. Home health care led the way with a 19 percent increase in earnings, followed by kidney dialysis centers, which gained 18 percent in revenues. Hospitals accounted for over half of all revenue for the health services sector, with offices of doctors taking the second largest share of revenue, and nursing and personal care facilities the third largest share.
(U.S. Department of Commerce, Census and You, August 1993)

Workplaces are becoming safer, but claims are more expensive, a new study of 700 companies shows. The average number of workers' compensation claims slipped to 10.1 for each 100 employees in 1991 from 10.9 two years earlier. But employers' cost per claim jumped 35 percent in the same period. These costs are rising mostly because of deficiencies in the handling of claims, not because of increased claims or higher benefits, say the Workers Compensation research Institute. It cites growing duration of disability, more attorney involvement and increasing lump-sum settlements. Higher medical costs are a factor, too.
(The Wall Street Journal, February 23, 1993 and April 27, 1993)

Caregiving

Greater involvement of fathers in child care is a trend that seems likely to continue. A Census Bureau study shows that in 1991, 20 percent of preschool children were cared for by their fathers while their mothers worked, up from 15 percent in 1988. Driving the trend are rising unemployment rates among men and the high cost of child care. Also, growth in part-time and shift work led many couples to share child care rather than paying a provider. These factors have not changed much from 1991 to the present.
(The Wall Street Journal, October 13, 1993)

Caregiving is extensive at all ages, a new analysis shows. The study involving 13,000 people age 19 and over showed that more than one in seven reported caring for a disabled or chronically ill relative or other person during the preceding year. About two-thirds were helping aged parents or others over 65. The heaviest burden fell on women aged 35 to 64, about 15 percent of whom provided caregiving.
(The Wall Street Journal, August 17, 1993)

Many employers are using new strategies to address employees' child-care problems. For example, one company customized child-care solutions for individual work sites, offering a child-care subsidy at one site, and an advisory committee, seminar program and resource library at another. Other companies are opting for infant-toddler programs only, backup child-care for emergencies, or joint programs with other companies. Another popular option for employers uses consultants to solve employees problems one-on-one.
(The Wall Street Journal, May 19, 1993)

Child Care

See Caregiving

Children

See Marriage and Family

Computer Programming

Mainframe computers usually contain hundreds of programs. Sooner or later, the master copy of one of these programs—the "source code" written in Cobol language—gets lost, and it is almost impossible to reconstruct the program from what is left of the ones and zeros in the system. However, using artificial intelligence techniques, orphaned machine code can now be translated back into Cobol, rather than less useful assembly code as previous techniques have done.
(BusinessWeek, October 26, 1992)

Computer Software

Software programs are notoriously hard to write—and once written even harder to change. One increasingly popular solution is object-oriented programming. The basic idea is to build programs out of self-contained modules or "objects." Rather than reinventing the wheel every time they create a program, software engineers can borrow prewritten modules from a library and simply plug them in.
(Fortune, February 22,1993)

A software program is now available which will maintain a database of every item in a very large document—text, charts, graphs, spreadsheets, even digitized sound and video. When its time to put the document together for delivery, whether on paper or CD-ROM, the software can reach across a network of computers and pull together the correct version of each item and assemble it in the proper order—in hours not months. Unlike previous versions of such software, this version works with computers and software of disparate brands, translating incompatible formats as necessary.
(BusinessWeek, January 31, 1994)

Tired of drawing a blank when someone calls? How would you like your PC to pull up information about the caller, including what you discussed with him or her the last time, before you even pick up the phone? A new software aims to capitalize on the emerging standards which will link the telephone and the PC. The software allows users to make and monitor phone calls right from the PC, as well as receive faxes, e-mail and other applications from one on-screen mailbox.
(BusinessWeek, January 31, 1994)

Computer Usage

The percentage of executives who regularly use computers nearly doubled in 4 years, to 81 percent in 1992 from 42 percent in 1989 according to a recent study.
(The Wall Street Journal, April 20, 1993)

Data Security

Industrial espionage via the telephone is a growing concern. For protection, a company has developed a telephone-security device which is simpler and cheaper to use, and portable, unlike previous devices. Simply plug the handset cord into the security device and plug the device into the telephone. By pressing a button, outgoing call signals are automatically turned into a stream of digital code that can only be unscrambled by a second security device attached to the receiving phone.
(BusinessWeek, September 28, 1992)

Data Storage

The compact disk was one of the great success stories of the 1980s, revolutionizing the recorded-music business. Now something similar is happening in the personal computer industry, because the CD-ROM (compact disk read-only-memory) can store tremendous amounts of data—up to 350,000 typewritten pages or 330 floppy disks worth of data. The only disadvantage is that information on the CD-ROM cannot be changed, erased or added to, but CD-ROM files can be copied to PCs. Companies are using CD-ROMs to store a variety of information, including technical manuals and inventory reports, and transmit the information to field offices with markedly reduced shipping costs.
(Fortune, June 29, 1992)

Demographics

See Population

Elder Care

See Caregiving

Employment

As companies embrace new technologies and eliminate jobs, millions of workers are finding that their old careers are becoming obsolete. From June 1992 to June 1993, the economy grew by 2.6 percent yet 500,000 clerical and technical positions disappeared, probably forever. Better information systems also eliminated the need for lots of middle managers. Yet history offers striking evidence that technological revolutions eventually create many more jobs than they destroy. For example, innovations such as electricity and the automobile brought forth vast new industries employing millions of people. Computer and software industries, entertainment, education and scientific research are potential areas for such job growth. It is happening now.
(BusinessWeek, June 14, 1993)

More than eight million U.S. workers have jobs in the health services industry. Its employment growth rate has been little affected by changes in the growth of the overall economy, with the result that the industry has become a primary source of new jobs during economic downturns. The industry's share of total nonfarm jobs rose from 5.8 percent in 1980 to 7.6 percent in 1991, an increase of 2.9 million jobs. The increase was widespread across the industry, and was fairly evenly distributed among major occupational groups.
(Monthly Labor Review, November 1992)

Total employment is projected to increase from 121.1 million in 1992 to 147.5 million in 2005 according to the moderate alternative projection of the Bureau of Labor Statistics. The projected 22 percent rate of employment growth is slightly higher than the increase attained during the previous 13-year period of 1979 to 1992. Asian and Hispanic women will make the fastest gains, and the median age of the labor force will rise to more than 40, the highest since the 1960s. Most of the employment growth will occur in service-producing industries, more than 25 million new jobs compared to fewer than 1 million new jobs in the goods-producing industries. Occupations experiencing the highest growth include home health aides, human services workers, personal and home care aides, computer engineers and scientists, systems analysts, physical and corrective therapy assistants and aides, and physical therapists. Professions predicted to decline include farmers, bartenders, and phone/cable installers.
(The Wall Street Journal, January 4, 1994 and Monthly Labor Review, November 1993)

Employment (cont.)

The share of workers who do not work full-time grew to 19 percent in 1992 from less than 16 percent in 1969. Research shows that virtually all this growth has been among those who work part-time on an involuntary basis. Some of these people would prefer full-time work but cannot find it, others have constraints such as a lack of child care.
(The Wall Street Journal, November 8, 1993)

Hispanics represent diverse nationalities and ethnic identities. They include Mexicans, Cubans, Puerto Ricans, persons from 15 Central and South American countries, Spain and the Dominican Republic, and their labor force characteristics differ substantially. Mexican Americans are the largest group, comprising 63 percent of the Hispanic labor force in 1992. Central and South Americans represent another 16 percent, followed by Puerto Ricans (9 percent), and Cubans (5 percent). Central and South American workers experienced the greatest growth over the past 6 years (61 percent) followed by a 28 percent growth in Mexican workers. These increases were almost entirely the result of rapid population growth fueled by large waves of immigration. Overall, Hispanic workers comprise less than 10 percent of the total civilian labor force.
(U.S. Department of Labor, Employment in Perspective, Third Quarter 1993)

Women are an important part of the Armed Forces and veteran population. A September 1991 survey found that women accounted for about 11 percent of active duty personnel, compared with less than 2 percent in 1970. Following the increase in the number of women in the military, the number of female veterans has also risen, reaching 1.1 million in 1991. The survey also found that female veterans were less likely to be members of minority groups compared to nonveterans, and more likely to be over the age of 65.
(Bureau of Labor Statistics, Employment in Perspective #823)

By far the most important labor market development between 1965 and 1992 has been the dramatic increase in the number and proportion of working women. This has been punctuated by particularly steep increases in labor force participation among women aged 25 to 54. The participation rate for women 25 to 34 advanced 35 percentage points to 74 percent in 1992; 30 percentage points to 77 percent for women 35 to 44; and 21 percentage points to 73 percent for women 45 to 54. Over the 27-year period, by contrast, men gradually reduced their labor force participation, partly because increasing numbers of them took advantage of opportunities for earlier retirement.
(U.S. Department of Labor, Employment in Perspective, Third Quarter 1993)

Service industries are challenging manufacturing's lead for unstable employment. From 1979 to 1983, 11.4 million jobs were lost due to plant closings, business failures and permanent layoffs. The service sector accounted for only 41 percent of those job losses, though it made up 68 percent of U.S. employment in the same period. In the 1985-1989 period, however, service industries share of job losses jumped to 53 percent while its share of employment only rose three percentage points to 71 percent.

Employment (cont.)

Researchers say that "the manufacturing sector isn't necessarily becoming more stable...but the service sector seems to be getting less stable."
(The Wall Street Journal, October 26, 1992)

Persons of working age (16 through 64) who have work disabilities numbered 14,150,000 in 1990. These persons constituted 9 percent of all working age persons. Of these work-disabled persons, 31 percent were employed, 5 percent were unemployed and 64 percent were not in the labor force. Fifty-six percent had severe work limitations, and 88 percent of this group was not in the labor force. The percentage of persons with a work disability remained generally constant between 1981 and 1988, and increases in the numbers reflect increases in the general population.
(CRS Report for Congress, August 3, 1992)

Recently available survey data indicate that the labor market status of immigrants is significantly different from that of U.S. natives. The unemployment rate for immigrants is somewhat higher and weekly earnings for immigrants working full-time lower than for natives. The data point to differences in the level of schooling as a major reason for these disparities. Although immigrants and natives aged 25 and older were equally likely to have completed at least 4 years of college, the proportion of immigrants who had completed fewer than 12 years of school was nearly double the proportion of natives. Less significant factors affecting the labor market status of immigrants included length of time living in the U.S. and immigrants' fluency in English.
(Monthly Labor Review, December 1992)

Between the ages of 18 and 30, a typical individual has held 7.5 jobs and has 8.6 years of work experience. This suggest that workers between these ages experience 3.4 years of joblessness. On their 30th birthday, over 40 percent of workers have held their current job for 2 years or less, and about 25 percent have been at their job more than 6 years. However, only 15 percent of individuals have spent 2 years or less in the longest job held between age 18 and 30. About 30 percent have spent more than 6 years in the longest job, with the average being 5 years. Black or female high school dropouts tend to have the least work experience and the least job tenure by age 30.
(U.S. Department of Labor, Work and Family, December 1993)

Hispanics are one of the nation's fastest growing worker groups, particularly Hispanic women. The Hispanic labor force demonstrated a growth rate of nearly 60 percent between 1980 and 1991 compared to a 15 percent labor force growth rate for non-Hispanics. This growth was propelled primarily by the rapid growth of the Hispanic population. The growth rate for Hispanic women was 67 percent for the same period. In 1994, Hispanic women's labor force participation rate was still 5.5 percentage points below that for other women 16 years and over. Currently, Hispanics comprise 7.8 percent of the total workforce and are projected to reach 11 percent of the total by the year 2005.
(U.S. Department of Labor, Employment in Perspective, First and Second Quarters 1992)

Employment (cont.)

College graduates entering the labor force in the 1990-2005 period will face a more competitive job market than that encountered by graduates during the 1984-1990 period. Projections indicate that the average annual openings in jobs requiring a degree during the 1990-2005 period will be fewer than during the 1984-1990 period, and the average annual number of bachelor's degrees awarded during the 1990-2005 period greater than during the 1984-1990 period. Researchers expect this trend to affect workers with fewer years of education as "underemployed" college graduates crowd out workers who would normally fill positions not requiring a college degree. For example, at least 35 percent of recent graduates now take jobs that do not require college degrees, up from 15 percent 5 years ago. Some graduates are even offering to work without pay simply to gain experience. This means that workers with specialized skills, such as bookkeeper, mechanic or technician, will fare better than those who lack specialized skills.
(Monthly Labor Review, July 1992 and The Wall Street Journal, May 20, 1993)

As people get older, they are less likely to change occupations—a trend that has not changed much since the 1960s. For example, the occupational mobility rate (i.e., the share of workers who say they are doing different work than they did one year earlier) for men aged 25 to 34 was 14 percent in 1966 and 12 percent in 1991. But for men aged 45 to 54, the rate was about 5 percent in both years. The decline in the rate as people age is attributed to the concern that older workers have more to lose by changing jobs than younger workers, such as higher pay, pensions and responsibility.
(American Demographics, December 1993)

Labor force participation rates for older men have declined dramatically since 1950. In 1950, 87 percent of men ages 55-64 worked, compared with only 68 percent in 1990. Participation rates for women ages 55-64, on the other hand, increased but remain substantially below the rates of older men. Currently, just 12 percent of all persons age 65 or older work, even on a part-time basis. Specialists say the proportion of older men on the job will soon begin to rise because more men are looking for and taking on mostly part-time post-retirement work. In 1981, 6.3 percent of employed 55- to 64-year old males were in part-time work. The figure jumped to 9.7 percent in 1991, an increase of more than 50 percent. A similar picture exists for men age 65 and over. This labor force activity combined with increasing life expectancies suggests that employers may face greater pension costs and the burden of hiring or retraining less senior workers. The greatest impact will be felt in year 2010, when the baby-boom generation begins to retire in significant numbers.
(The Wall Street Journal, August 8, 1992 and Population Reference Bureau Bulletin, Vol. 46, No.3)

Equal Employment Opportunity

"Double minorities", such as black women, do not have an advantage in the workplace according to researchers. A study of U.S. Census figures show that black women do not get an extra boost from company employment policies favoring minorities and females. It takes 10 months for black women to earn what white females and black men make in 8 months, and white males make in 6 months. The pay gap stems from women's overrepresentation in lower-paying service jobs, as well as black employees tendency to be at the bottom of corporate organizational charts. A related survey of female managers found that black respondents felt more isolated and that they had less organizational support than white women.
(The Wall Street Journal, January 19, 1994)

The Women's Research and Education Institute says that at the current pace, it will take 75 to 100 years for women to achieve equitable representation and pay at all management levels.
(The Wall Street Journal, March 16, 1993)

Sexual harassment complaints lodged with the Equal Employment Opportunity Commission climbed to 1,608 in the 1992 fourth quarter, from 1,244 in the final quarter of 1991, and 728 in the last three months of 1990. Total discrimination charges under federal law could increase by 30 percent from the fiscal year ending September 30, 1992 to about 80,000 in fiscal year 1993.
(The Wall Street Journal, March 16, 1993)

A recent study of 925 M.B.A. holders indicated that married men with children whose wives do not work outside the home earn 20 percent more than men in two-earner households, married men without children, and bachelors. The study concluded that nontraditional men "do not fit the stereotype of the 'organization man' able to devote all his energies to meeting great work demands." The study also found that single-women managers, once preferred over married women, now earn less because they are viewed as having less attachment to their organizations.
(The Wall Street Journal, November 2, 1993)

Pregnancy-discrimination complaints to the Equal Employment Opportunity Commission hit a 6-year high in 1993. Propelling the rise is "a combination of the continuing persistence of sex discrimination in the economy, and a heightening public awareness not only that it is illegal, but that it is possible to do something about it." Also accounting for the rise are increases in the proportion of employed women who have given birth in the past year to 54 percent in 1992 from 51 percent in 1988, a continuing rise from only 31 percent in 1976. The growing need of women's wages in supporting families has also resulted in an environment where women are willing to sue "to protect the family's economic future."
(The Wall Street Journal, December 6, 1993)

Ethics

A recent study suggests that supervisors can encourage employees to report misconduct by removing the issue of ethics from whistle-blowing. The study found that employees would be more willing to report a colleague if such

Ethics (cont.)

reporting were a clearly defined job responsibility and if employees helped to develop the code of conduct. In a test case involving theft of company goods, incidents of theft fell 80 percent after the company implemented the above principles.
(The Wall Street Journal, April 2, 1993)

Financial Stress

The recent recession's bite was broader and deeper than standard economic measures indicated according to a recent survey. The survey interviewed more than 1,000 nationally representative adults in 1991, asking how they had fared at work and financially in the preceding year. About 850 were re-interviewed in early 1992 on how they had done in the intervening 12 months. Regarding work-related problems, one-fourth of all households reported pay cuts for the husband, wife or both at some time during the 2 years, with more occurring in the second year. Another 16 percent had at least one adult losing his or her job. With financial problems, 28 percent reported a major worsening of their financial condition in the 2 years, with 25 percent experiencing pressure from creditors to pay bills. More than 11 percent had been obliged to pawn possessions, while about 2.5 percent had goods repossessed and more than 3 percent had gone into bankruptcy.
(The Wall Street Journal, October 19, 1993)

The new face of personal bankruptcy is a well educated, middle class baby boomer with big-time credit card debt. These baby boomers make up 44 percent of the adult population, but they account for 59 percent of personal bankruptcies. Also, the bankruptcy debtor is increasingly female with women accounting for 28.6 percent of filers, up from 17 percent a decade ago. Factors cited as precipitating these bankruptcies included medical expenses, divorce, and job disruption.
(The Wall Street Journal, October 7, 1993)

Flexible Scheduling

Trends in flexible scheduling suggest Americans increasingly are early risers. A growing number of employers who allow employees to chose their own schedules find a surprising number are starting work before dawn. An informal survey at one company revealed that 18 percent want more time late in the day to care for family members or do errands. Another 18 percent wanted to get a running start on making sure systems are working before customers need them, and 18 percent say they get more work done in the early-morning hours when interruptions are few and computer systems are free.
(The Wall Street Journal, October 13, 1993)

Foreign Investment

Foreign investors spending to acquire or establish businesses in the U.S. in 1992 fell for the fourth straight year. Foreign direct investment fell 47 percent in 1992 to $13.5 billion, the lowest level since 1983. By industry, in 1992, the largest declines were in banking, down 89 percent; insurance, down 88 percent; machinery manufacturing, down 86 percent; and retail trade, down 79 percent.
(The Wall Street Journal, June 9, 1993)

Foreign Investment (cont.)

An aggressive strategy to attract foreign investment has transformed the region bordering Interstate 85 (I-85), the Southeast's primary transportation artery, from an economic sleeper into a fast growing powerhouse. Between 1985 and 1992, nonfarm employment along I-85 grew 17.8 percent, compared to 11.2 percent for the country as a whole. Per capita income shot up 46.3 percent versus 40 percent for the nation, helping to narrow the region's historic wage gap. The region also includes four of the country's five entrepreneurial hot spots, and a poll of corporate executives predicted the region will be the "preferred megacorridor for business" in the 1990s.
(BusinessWeek, September 27, 1993)

Globalization

The move toward a global work force takes many forms and consists of more than a stampede to low-wage countries. For example, American direct foreign investment still appears to be creating jobs at factories in high-wage countries, such as Canada and Europe. In 1990, American companies employed 2.8 million people in Western Europe, up 4 percent from the previous year. That was a bigger jump than the 2 percent rise, to 1.5 million, in Asian workers they employed, or the 2 percent increase in Latin American workers they employed, to 1.3 million.
(Fortune, December 14, 1992)

Health Insurance

Young Americans lack health insurance out of proportion to their numbers. People under age 25 make up just over one-third of the population but represent nearly 50 percent of people with no health coverage. People aged 16 to 24 are least likely to be covered with 22 percent lacking insurance in any given month. Coverage was highest among the youngest group, 15 and under, with only 14 percent lacking coverage in a given month. Comparatively, 13 percent of the total U.S. population has no health insurance.
(The Wall Street Journal, August 12, 1992)

Hiring

Fully 68 percent of companies surveyed by a personnel firm say it has become harder to check job applicants' references. Former employers say nothing or only nice things, and companies clam up for fear of lawsuits from former employees. This often drives costs up as firms require an applicant to undergo multiple interviews. Forty-four percent of the companies surveyed said that a former employer's reluctance to comment hurts an applicant's chance of being hired.
(The Wall Street Journal, February 23, 1993)

Housing

Overcrowding in housing increased in the 1980s for the first time in 50 years. Demographers found that in 1940 just over 20 percent of all housing units met the definition of overcrowded, defined as more than one resident per room. From then on, the rate fell steadily to 11.5 percent in 1960 and 4.5 percent in 1980. However, in 1990 the rate rose to 5 percent, with the overcrowding concentrated in renter occupied units. Researchers suggested several explanations, including the rise in poverty during the 1980s and higher housing costs. They also cite an increase in immigrants whose societies prefer living in large family groups. New York and California experienced the greatest overcrowding.
(The Wall Street Journal, July 20, 1993)

Housing (cont.)

The Northeast was the only U.S. region that saw an increase in homeownership from 59 percent in 1980 to 61 percent in 1990 when national homeownership rates fell. This was due to the heavier than average concentration of people aged 45 to 74 in this region, a group most likely to own their homes and stay put. People who move from one region to another tend to be young renters, which are more heavily concentrated in the Midwest, South and West.
(The Wall Street Journal, November 8, 1993)

The median monthly owner cost for homeowners with a mortgage was $737 in 1990, compared with $581 in 1980, an increase of 26.9 percent after adjusting for the increase in consumer prices. Owners without mortgages had a monthly cost of $209 in 1990 and $206 in 1980 after adjusting for inflation. For 19.5 percent of all homeowners, monthly costs were 30 percent or more of their household income in 1990, compared with 17.6 percent in 1980. In contrast, 41.2 percent of renters had monthly costs that were 30 percent or more of their household income in 1990, compared with 38.9 percent in 1980.
(United States Department of Commerce News, #CB92-87)

Illegal Activity

Insurance portfolios, underfunded pensions and HUD-backed mortgages could be ripe areas of financial "looting" in the future. The key elements for such looting are big sums of money with some government guarantee. In a typical situation a looter buys a firm rich in current financial assets in a business where future liabilities are tough to pin down. The owner then reaps the cash through dividends, salaries or inside deals while skewing accounting so regulators do not detect the problems.
(The Wall Street Journal, January 13, 1994)

Money launderers are coming up with elaborate schemes to avoid detection. Techniques include front companies issuing fake invoices disguised as legitimate sales, crooked insurance brokers, money transmitters, postal orders redeemed through foreign banks, and currency exchange shops. It is estimated that criminals launder $300 billion annually using these schemes.
(Business Week, June 28, 1993)

Income

See Personal Income
See Business Finances

Information Management

See Computer Software
See Data Storage

Job Cuts

Workers age 35 to 54 years old are more vulnerable to jobs cuts than in the past according to a recent study. The cuts do not mean these workers will not work again, but they are likely to find lower-paying jobs with fewer benefits. In the trough of the last two recessions, the percentage of 35 to 54 year olds who were unemployed due to permanent job loss was more than 45 percent. That compares with about 35 percent of the unemployed who lost their jobs in the previous three troughs.
(The Wall Street Journal, April 20, 1993)

Job Satisfaction

A broad new survey of American workers depicts a work force that has little loyalty to employers and is deeply divided by race and gender. For example, over half of surveyed worker of all ages said they prefer working with people of the same race, gender, and education. The study also indicated that minorities who perceive discrimination have a higher tendency to feel "burned out." Women who said they saw little opportunity for career advancement also tended to be less loyal, less committed, and less satisfied on the job. It also suggested that workers place high value on flexible scheduling, attention to personal needs, and management recognition for work well done—and that they are willing to make trade-offs, including changing jobs, to get them. About 25 percent without flexible scheduling or the right to work at home said they would change jobs to gain those opportunities. Of those who lacked the right to time off to care for sick family members, 47 percent said they would take a cut in pay or benefits to get it. The study found a high correlation between these nontraditional benefits and greater feelings of loyalty and commitment toward the employer. Traditional benefits, such as health insurance, did not have the same impact.
(The Wall Street Journal, September 3, 1993)

Leased Employees

Leasing employees is becoming a popular way for employers to save on costs associated with permanent employees, such as health costs, and remain flexible to changes in workload. At the same time, employees receive better benefits by working full-time for the leasing companies.
(The Wall Street Journal, March 16, 1993)

Literacy

See Training and Education

Marriage and Family

The traditional, two-parent family is being displaced by the single-parent household. The percentage of white children living with one parent has almost tripled, to 19.2 percent during the past 3 decades, and it has more than doubled among blacks, to 54.8 percent. About half of all marriages now end in divorce, and the percentage of out-of-wedlock births increased in the past years from 7.0 to 19.2 percent for whites, 28.7 to 51.8 percent for blacks, and 19.8 to 32.6 percent for Hispanics. Researchers attribute the shift to more permissive attitudes toward sex and marriage, the urban drug culture, the surge of women into the labor force, women's increased earning power, and a drop in the employment opportunities for young black men.
(BusinessWeek, June 29, 1992)

Family problems upset men at work just as much as women, a study finds. A sample of 300 couples with both husband and wife employed full-time showed that stress over problems with children or marital conflict appeared to be more related to rigid full-time work schedules than to gender. Men working full-time, for instance, were more likely to bring family concern to the office than women working part-time. The study suggests that men need flexible schedules and understanding bosses as much as women, and that people of either gender with problems at home are less likely to handle work challenges well.
(The Wall Street Journal, January 5, 1994)

Marriage and Family (cont.)

When traveling, more business people are bringing their children with them. Fueling the trend are the prevalence of two-career couples, the popularity of combing business and pleasure trips, and the spread of low air fares requiring weekend stopovers. Of the 278 million business trips taken in 1992, 16 percent included children, up from 13 percent in 1991.
(The Wall Street Journal, January 11, 1994)

American men and women are marrying later than any time in history, but almost all get married by middle age. The median age of first marriage for men rose to 26.5 years in 1992 from 25.5 in 1985 according to the Census Bureau. At the turn of the century, half of men were married by their mid-twenties. The figure dropped to 22.6 in the mid-1950s and then rose again. For women, half were married by age 22 at the turn of the century, and the median fell to a low of 20.2 in the mid-1950s. In 1992, the median for women rose to a record 24.4 years. By their early forties, 91 percent of men and 92 percent of women have been married at least once, though only 78 percent of men and 74 percent of women age 40 to 44 are currently married.
(The Wall Street Journal, March 5, 1993)

Many of the social changes that redefined family life in America, including the rising divorce rate and dropping family size, are stabilizing. A Census Bureau report indicated that none of the trends have reversed, but that (1) the number of single parents rose at a much higher rate in the 1970s than it has since; (2) the 30-year rise in the number of persons living alone appears close to ending; (3) the divorce rate has stabilized at a high level, but future rates have been revised downward; and (4) the long-term decline in the number of children per household may have "bottomed out." The report also showed that the married-couple family with two children has not constituted, at any time in the recent past, a majority of American households. In 1970,13 percent of households were made up of this type of family. Today the proportion has shrunk to 10 percent.
(The Washington Post, June 24, 1993)

Having two children is increasingly the ideal among American women. A Census Bureau report indicated that 50 percent of childless women ages 18 to 34 said they expected to have two children, up from 46 percent in 1982. Among women with one child, 42 percent expected to have one more. And among those who already had two children, 81 percent say they will stop there. The proportion of women who expect to remain childless fell to 9 percent in 1992 from 12 percent in 1982.
(The Wall Street Journal, August 6, 1993)

Migration

See Population

Pension Funds

See Aging and Retirement

Personal Computer (PCs)

Sooner or later, every computer's hard drive will suffer a fatal crash. Sometimes, due to various factors, the data stored on the drive cannot be recovered using standard methods—until now. A company has developed a

Personal Computers (PCs) (cont.)

proprietary data-signal analyzer system so sensitive that it can even restore information "buried" under newer data. The system maps the disk's magnetic signals and electronically subtracts the strong signals that represent the latest data. The faint signals that remain are computer-analyzed to reconstitute the original data. It is not always 100 percent successful and is "horribly expensive," but for irreplaceable information it offers hope.
(BusinessWeek, June 15, 1992)

A keyboard is now on the market that looks like any other designed for IBM PCs, but this one doubles as a TDD terminal. It plugs into any phone system, including private branch exchanges, and has standard TDD features such as a liquid-crystal display screen to keep track of typed conversations. The keyboard does not require any special software or interfere with normal PC operation. Furthermore, it eliminates the need for an extra piece of equipment on employees desks.
(BusinessWeek, June 7, 1993)

Imagine an electronic blackboard with the memory and processing power of a computer and the ability to be shared by people located miles away from each other. A new system called "Live Board" combines a 67-inch color video screen, a wireless pen and a 486-based PC. Together they serve as a "smart" writing surface that professionals can use to make meetings and discussions more efficient and productive. Connect two of the boards by telephone and it lets distant groups collaborate. They can share information stored in the computer, annotate it by hand, store the final result, and make printouts on a laser printer.
(BusinessWeek, May 24, 1993)

The trouble with magnetic disk drives is that unlike most computer components, they contain moving parts than can break down and lose critical data. But now a company has produced a disk storage system for PC networks that has the ability to heal itself. When one portion of any platter within the disk shows signs of degrading, the drive's internal computer automatically copies endangered data to a safer location. If a more serious problem is detected, the system will alert technicians at a designated workstation on the network or notify them via a standard beeper service.
(BusinessWeek, July 12, 1993)

Personal Income

Women still earn only 70 cents for every dollar earned by men, according to 1991 median annual wage data from the Census Bureau. That is up a dime from 1963—which means women's earnings have gained on men's by one-third of one percent a year over the past three decades. Black and Hispanic women fare worse, earning 62 and 54 cents, respectively. The figures are just averages, calculated for all jobs ranging from door-to-door sales to deal making. Numbers for individual professions show that it is often the hourly workers who come closest to equality with men, while white collar workers earn as little as half as much as men. Also, studies have repeatedly demonstrated that lack of credentials do not explain the differences. Women are less likely to be offered pensions, health coverage and disability. Studies show it has little to do with child-rearing and more to do with a greater proportion of women work in lower paying jobs compared to men.
(The Wall Street Journal, April 13, 1993 and June 9, 1993)

Personal Income (cont.)

More than one-third of U.S. households have no discretionary income. In 1992, only 64 percent of households had income left after paying for the necessities of life, including food, clothing, housing and taxes. The average available in the households was $11,300, and the average per person was $4,300. Women headed families were the worst off with only 40 percent of households having discretionary income. Men living alone were the most well off with 86 percent of their households having discretionary income. *(The Wall Street Journal, August 6, 1993)*

Population

New Census Bureau projections show that the baby boom may peak in 1997 at close to 78 million, when its members are aged 33 to 51. The numbers head downhill from there, and they will dip below the 1970 level of 73 million sometime between 2010 and 2020. Overall, boomers will decline from 41 percent of the population in 1990 to 38 percent in 2000. Nonetheless, their political and economic power will keep growing. *(American Demographics, September 1993)*

The Census Bureau, sharply revising its view of America's future, now foresees a lot more people. During the next 58 years, the nation's population is expected to increase by a stunning 50 percent to 383 million in the year 2050. In this decade alone, the U.S. population is projected to surge 7.8 percent, more than any other decade except the 1950s. The Bureau says it underestimated fertility rates, immigration and longevity. According to some analysts the impact will be more evident in certain parts of the country, such as California, which adds 600 school-age children to its population every day, many of them immigrants. *(The Wall Street Journal, December 4, 1992)*

Poverty

Newly single mothers may have the highest poverty rates in the population, but unchanged families make up the great majority of households that become poor during a given year. According to a Census Bureau study, of the 14.4 million households that became poor during any 1-year period between 1983 and 1988, 32 percent saw their family status change during that year through marriage, divorce, death or other reasons. The family status of the remaining 68 percent was unchanged. Of these 68 percent, nearly half were married couples who experienced a decrease in one or both spouse's working hours, loss of one or both spouse's jobs, or a decrease in pay but not working hours. Also, while 11 percent of the total poor households were headed by newly single women, 12 percent were headed by women in unchanged families. More than half of these unchanged families became poor without any change in the women's work hours. *(The Wall Street Journal, January 27, 1993)*

Rural poverty differs from urban poverty in significant ways. In 1990, just over nine million people in rural areas fell below official poverty definitions, compared to more than 24.5 million in metropolitan areas (which include suburbs). Fourteen percent of the rural poor were 65 or older, a level 50 percent higher than their urban counterparts. Almost 65 percent of poor rural families had at least one member formally employed, compared

Poverty (cont.)

with 54 percent in urban areas. Also, more of the rural poor live in married-couple families than in female-headed families. Rural poverty was found to be more persistent (defined as lasting 10 years or more) than urban poverty regardless of age or family structure.
(The Wall Street Journal, October 19, 1993)

Promotions and Appraisals

Researchers say that management is no longer the only fast track to higher-paying, more responsible positions. Technical positions can enable professionals to rise without going into management, although some say the technical path is less lucrative and takes longer to climb. Two-thirds of companies surveyed say they are happy with technical job ladders, however, half said employees still see management as more desirable.
(The Wall Street Journal, March 9, 1993)

At some companies, a good performance appraisal no longer equals an immediate pay raise. More and more employers are now separating compensation reviews from performance appraisals. This process allows employees and managers to focus more on career development during performance appraisals rather than how much the employee is worth to the company.
(The Wall Street Journal, May 10, 1993)

Relocations

Women accounted for about 18 percent of corporate moves in 1992, up from 5 percent in 1980. By the year 2000, experts say one-third of transferees will be female, and one in four "trailing spouses" will be men—up from 15 percent in 1990 and 7 percent in 1985.
(The Wall Street Journal, April 13, 1993)

Retirement

See Aging and Retirement

Tax Gap

See Illegal Activity

Training and Education

A record 63 percent of 1992 high-school graduates enrolled in college in fall 1992, up from about 50 percent in 1980. That included 64 percent of whites, but only 49 percent of blacks and 57 percent of Hispanics. For the 400,000 high-school dropouts during the 1991-1992 school year, the unemployment rate was 39.1 percent, about double the rate for high-school graduates.
(The Wall Street Journal, May 18, 1993)

Among the nation's population aged 25 and over in 1990, about 75.2 percent were at least high school graduates and 20.3 percent had at least a bachelor's degree.
(United States Department of Commerce News, #CB92-87)

In addition to training needed to qualify for their jobs, many workers take training to improve their skills. In 1991, 41 percent of all employees reported taking such training since obtaining their present job, up from 35 percent in 1983 (and compared to a 19 percent increase in employment over the same period). Formal company-sponsored training and informal on-the-job training were the largest sources of training to improve skills, and high school and post-high school vocational training the smallest source. Analysis indicates

Training and Education (cont.)

that earnings are higher in jobs in which training is taken to improve skills. For example, excluding workers with less than 12 years of education, the median weekly earnings for workers whose only training was training to improve their skills were about 30 percent higher than those with no training.
(Monthly Labor Review, October 1993)

Two-year community colleges are becoming the key to corporate retraining efforts by offering programs which upgrade workers' skills so U.S. companies can stay globally competitive. More than half of the 1,158 community colleges in the U.S. started workplace retraining programs from 1987 to 1991, and currently 67 percent of all community colleges offer a retraining program. The curriculum includes courses on subjects such as problem solving, processing methods and accounting, and is often tailored to the needs of local employers. Furthermore, the community colleges are 10 to 20 percent cheaper than professional trainers.
(BusinessWeek, September 27, 1993)

In the next decade, 70 percent of jobs will require training other than college, and greater demand will be placed on high-skill jobs. In 1991, 25 percent of U.S. workers were college graduates, but only 16 percent reported needing their college training for their jobs. Moreover, high-school graduates who received training to qualify for jobs and to improve their skills had slightly higher median earnings than college graduates who received no training. The premium on high skill jobs is demonstrated by the 32.4 percent surge between 1983 and 1991 of managerial and professional jobs which required formal schooling or training.
(The Wall Street Journal, November 9, 1993)

Underground Economy

See Illegal Activity

Wealth

The necklace of cities that runs from Portland, Maine to Alexandria, Virginia contains many of America's most affluent counties. Of the 20 counties with the highest concentrations of households earning $50,000 or more, 15 are in the northeastern megalopolis. The Northeast may have suffered more than other regions during the recent recession, but it also gained the most from the boom of the mid-1980s. Other areas with high concentrations of households earning $50,000 or more include the suburbs of Chicago and San Francisco, Los Alamos County in New Mexico, Douglas County in Colorado, and Fayette County in Georgia.
(American Demographics, December 1992)

Workplace Violence

A recent survey of human resource professionals revealed that 32 percent of these professionals had experienced one or more acts of violence in their workplace since 1989, with more than 80 percent of the incidents occurring since 1991. Significant was the number of respondents reporting two to five acts of violence since 1989—54 percent of respondents. Of the total incidents, 75 percent were fistfights or other physical altercations, 17 percent were shootings, 6 percent were sexual assaults, and 8 percent were stabbings. The majority of acts were committed by an employee toward another employee (54 percent) and more than 80 percent of the violence was committed by males.
(Society for Human Resource Management, November 29, 1993)

Work-Related Stress

Sometimes the best way to handle overload at work is to take on more work—in a different field. A growing number of managers and professionals with demanding careers are pursuing an additional interest, often in a creative field and for pay. For example, people have become gourmet cooks, singers and jazz pianists. One management psychologist says that pursuing a second vocation can be an opportunity to express a different part of yourself, and then come back to your main career revitalized. Proceeds from the second vocations are often donated to charities.
(The Wall Street Journal, December 22, 1992)

Reporting Noncompliance Evidence From Timely Filed And Secured Delinquent Individual Tax Returns

by Chih-Chin Ho

This article presents the newly developed line item-based noncompliance measures to analyze reporting compliance issues for individual income tax returns. It presents the noncompliance estimates for both timely filed and secured delinquent (late filed) returns for tax year 1988 based on the Taxpayer Compliance Measurement Program (TCMP) survey data. It further sorts these noncompliance measures by business and non-business return segments. Our findings show that business returns (i.e., self-employed individuals filing Form 1040 with Schedule C or Schedule F) engaged more in underreporting income than overstating offsets in comparison to their non-business counterparts. This was true whether the returns were filed timely or were secured delinquent returns. For both business and non-business returns, timely filed returns are more compliant than secured delinquent returns in reporting positive income. The findings also give insights into the nature of two of the more serious reporting compliance problems: underreporting nonfarm sole proprietor (Schedule C) income and overstating earned income tax credits (EITC). A few suggestions for dealing with problem areas are also presented.

Background

Noncompliance Measures — Net Misreported Total (NMT)

This article introduces three new concepts of reporting noncompliance for individual income tax returns: net misreporting percentage (NMP) and net misreported average (NMA). Both measures focus on the net misreported total (NMT) for specific return line items. In this report or in all subsequent Compliance Research Division reports on noncompliance, these measures of reporting **noncompliance** replace their counterparts in voluntary **compliance** (such as voluntary reporting percentage) traditionally used in IRS tax compliance analyses. For an income item, the NMT is defined as the sum of all amounts **underreported** minus the sum of all amounts overreported on the item. For an offset (deduction) item, the NMT is defined as the sum of all amounts **overstated** minus the sum of all amounts understated on the item.[1] Therefore, for income items and offset items, a larger total indicates more noncompliance.

Net Misreporting Percentage (NMP)

The net misreporting percentage (NMP) for a given return line item is defined as the **percentage ratio** of the NMT to the **sum of absolute values of the amounts that should have been reported**. The NMP replaces the voluntary reporting percentage (VRP), which was a concept previously used in Research Division reports on noncompliance. The VRP was the amount reported for a given line item, expressed as a percentage of the amount that should have been reported. The VRP denominator was the sum of algebraic values of the amounts that should have been reported. To eliminate the distortion of combining positive (gain) and negative (loss) amounts, the denominator of the NMP is the sum of absolute values, rather than algebraic values, of the amounts that should have been reported. This allows us to report noncompliance rates for all items, even those income items which can be negative. In earlier reports, VRP's for such items were omitted.

Net Misreporting Average (NMA)

The net misreporting average (NMA) for a given return line item is defined as the **dollar quotient** of the NMT to the **number of returns that reported, and/or should have reported non-zero amounts**. By controlling for the number of **relevant** returns, the NMA provides a measure of the magnitude of noncompliance pertaining to a particular set of relevant returns.

Interpretation of New Noncompliance Measures

The NMA and NMP are complements in measuring reporting noncompliance and provide a basis for comparison across various line items within a particular set of returns or across various sets of returns with reference to a particular line item. Each of these measures has the NMT as its numerator. The NMP focuses on the degree of noncompliance in relation to the reporting obligation, while the NMA focuses on the number of noncompliant taxpayers in relation to the relevant population of taxpayers.

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For example, a NMP of positive 5 percent for line item "farm income" would indicate that, in total, 5 percent of the sum of **absolute values of** farm income that should have been reported was not reported. Some of this misreporting resulted from understating gains while the remainder resulted from overstating losses. For line item "other tax credits", a NMA of positive $25 would indicate, on average, $25 of other tax credits per relevant return was overstated, with some taxpayers overstating these credits and others understating their tax credits.

Results showing NMA and NMP with positive values indicate errors that are to the "taxpayer's benefit" (i.e., serve to lower their tax liability). In contrast, negative NMA and NMP results indicate taxpayer errors that are to be the "government's benefit" (i.e., by themselves, would result in taxpayers overstating their true tax liability). However, in practice, negative and positive measures often occur in relation to each other such as when income is reported on the wrong line item, thus causing an overstatement of income in one area and an understatement in another.[2]

TCMP Survey Data

The reporting noncompliance measures presented in this article were estimated using TCMP survey data for both timely filed and secured delinquent returns. Within each data set, returns are further classified as non-business and business returns.

Individual Filer Survey

The TCMP Phase III, Cycle 10 survey contains a national stratified random sample of 54,000 individual returns from a population of 104 million timely filed returns for tax year (TY) 1988. These 54,000 returns were subjected to TCMP audits using a special IRS examination procedure designed to measure reporting compliance on a return line item basis.

TCMP examiners check out all information on the returns and relevant records that the taxpayers are asked to provide. These intensive line-by-line examinations reveal understatements of income and overstatements of offsets by comparing the amounts that taxpayers report on their returns and the amounts TCMP examiners determine should have been reported on those same returns.

Individual Nonfiler Survey

While the TCMP Phase III, Cycle 10 data covers timely filed returns, a separate survey, TCMP Phase IX, Cycle 2, focuses on nonfiling situations for tax year 1988. This nonfiler survey includes two facets, a collection-based portion to secure the delinquent returns that should have been filed, and a subsequent examination-based portion to determine the reporting accuracy of those secured delinquent returns.

The collection portion of the TCMP Phase IX, Cycle 2 survey indicated that about 5 million individuals would be judged as being delinquent in filing for TY 1988, if all potential nonfiler leads were carefully pursued by IRS. About four million would result in a delinquent return being secured from routine IRS contacts and another one million would be judged as having a filing requirement but would require much stiffer IRS enforcement efforts to resolve the matter.[3]

The examination portion of this TCMP Phase IX, Cycle 2 survey consists of a random subsample of 2,200 returns representing the 4 million nonfilers where a secured delinquent return would be forthcoming in the event of routine IRS contacts. These 2,200 secured delinquent returns were subjected to the same intensive line-by-line audit as the 54,000 timely filed returns.

Comparison of Noncompliance Measure Estimates

To control sample stratification variations and minimize heterogeneity in return characteristics, we estimated NMP and NMA separately for two distinct return income segments (i.e., non-business or business) within each return type (i.e., timely or delinquent).

The stratification of individual returns into business versus non-business is based on existing examination class definitions. These definitions weigh the relative magnitude of total positive income (TPI) from non-business sources against total gross receipts (TGR) from any Schedule C and F sources. The TPI is the sum of all non-business income amounts greater than zero (i.e., excluding loss amounts). The TGR is the sum of all receipts on nonfarm business income (Schedule C) and farm income (Schedule F).[4]

To gain insights on how reporting noncompliance compares across different return types (timely/delinquent) and income segments (business/non-business), we estimated both measures of all income and offset line items for each of the four data sets pairing with a return type and a return segment.

To ascertain the significance of such comparisons, standard t-tests were used to determine whether the difference in a particular measure between any two sets of returns was statistically significant.[5]

Empirical Findings

Overall Noncompliance

The NMP and NMA estimates for each Form 1040 income and offset line items are shown in Table 1 for timely filed returns and in Table 2 for secured delinquent returns.

The noncompliance measure estimates under "non-business" and "business" are based on the returns of non-business and business examination classes, respectively, and those under "all" are based on the returns of all examination classes. The main empirical findings are summarized as follows.

Loss-Included Income Accounts for Greater Reporting Noncompliance Than Positive Income

Loss-included income (e.g., capital gains) had significantly higher NMP estimates than positive income (e.g., wages and salaries). This pattern is particularly pronounced with timely filed returns (Table 1, all tables located after endnotes) in which the NMP estimate is 25 times higher for loss-included income than positive income (13.37 percent versus 0.52 percent, respectively). Among all income items, nonfarm sole proprietor income and farm income had the highest estimates for both timely and delinquent returns.

In line with the results for NMP, loss-included income had significantly higher NMA estimates than positive income. This pattern is particularly pronounced in secured delinquent returns (Table 2) in which the NMA estimate is 15 times higher for loss-included income than positive income ($4,916 versus $323, respectively). Among all income items, state income tax refunds had the lowest NMA estimates which indicates relatively good compliance.

Three factors likely contribute to the above results. First, almost all of positive income are covered under the information reporting program (IRP) document matching process or subjected to withholding.[6] Second, except for rents, royalties, prizes and awards, none of the loss-included income are covered under IRP or subject to withholding.[7] Third, all of the loss-included income consist of receipts and expenses, which would result in underreporting income either from underreporting receipts or from overstating expenses.[8]

Tax Credits Account for Greater Reporting Noncompliance Than Income Offsets

Tax credits (e.g., earned income tax credits) have higher NMP estimates than income offsets (e.g., itemized deductions). Among all offset items, earned income tax credits (EITC) had the highest NMP estimates (in excess of 50 percent), while personal exemptions had the lowest estimates (under 8 percent) in the NMP. This pattern is particularly pronounced with secured delinquent non-business returns in which the NMP for the EITC is greater than 100 percent.

Note that since tax credits directly offset tax liabilities, rather than taxable income, their NMA measures are not comparable with those of income offsets.

Pattern Comparison

Table 3 presents the differences in the NMP and NMA measures between delinquent and timely returns pertaining to separate business and non-business segments. Table 4 presents the differences in both measures between business and non-business returns pertaining to separate timely and delinquent groups. Note that Table 3 is a result of secured delinquent return figures in Table 2 minus timely filed return figures in Table 1. Table 4 is a result of business return figures minus non-business return figures from Table 1 for timely filed returns and from Table 2 for secured delinquent returns.

Based on the standard t-test of the differences in selected noncompliance measures, all the differences contained in tables 3 and 4 are statistically significant at a 95 percent confidence level.[9] The main findings from these comparisons are summarized as follows.

Comparison of Timely and Delinquent Returns

Within the business return segment, delinquent returns had **higher** noncompliance estimates in both measures for wage income, interest income, dividends, social security benefits, nonfarm sole proprietor income, farm income, EITC and other tax credits; but **lower** estimates in both measures for other income, rents and royalties, and itemized deductions than their timely filed counterparts.

Within the non-business return segment, delinquent returns had **higher** noncompliance estimates in both measures for dividends, capital gains, pensions and annuities, other income, rents and royalties, itemized deductions, statutory adjustments, and EITC than their timely filed counterparts.

Overall these findings reflect that timely returns are more compliant than their delinquent counterparts in reporting positive income and tax credits.

Comparison of Business and Non-Business Returns

Within the delinquent return group, business returns had **higher** noncompliance estimates in both measures for wages, interest income, dividends, social security benefits, and farm income; but **lower** estimates in both measures for other income, partnerships and small business corporations (SBCs), statutory adjustments, itemized deductions, and EITC.

Within the timely return group, business returns had **higher** noncompliance estimates in both measures for wages, dividends, and social security benefits, but **lower** estimates in both measures for itemized deductions, personal exemptions, and other tax credits.

These findings reflect a general noncompliance pattern in which business filers engaged more in underreporting income than overstating offsets. This is because they can underreport business income through overstating business expenses, while non-business filers have no deduction components of positive income to overstate.

Compliance Issues

Underreporting nonfarm sole proprietor income (Schedule C) and overstating earned income tax credits (EITC) represent two of the more significant issues in reporting noncompliance across all types of individual returns. For example, the NMP estimates for these two components for all timely filed returns are 22.2 percent and 50.5 percent, respectively (Table 1). The empirical findings presented in this article sheds some insights into the nature of these compliance issues.

Overstating of Schedule C Business Expenses among Delinquent Business Filers

Delinquent business returns (Table 2) had high noncompliance in reporting non-farm Schedule C income (NMP of 30.1 percent). However, they also involved considerable underreporting of itemized deductions (NMP of -4.55 percent). The differences in both measures between delinquent business and non-business returns for both Schedule C income and Schedule A deductions are significant.

This may be a reflection of benign misclassification between business expenses and itemized deductions. For example, mortgage interests or real estate taxes might have been misclassified as business expense deductions for nonfarm sole proprietors, which would trade Schedule C income with Schedule A offset and leave taxable income intact.

More likely, however, it may be a result of calculated recharacterization of non-business deductions for business deductions to underreport self-employment taxes, even in the case of a zero-sum game for individual income taxes.

Our preliminary examination of all delinquent business returns involving simultaneous overstating business expenses and understating itemized deductions shows that there seems to be a relationship between the offsetting actions, but none of which show strong statistical significance.

From a compliance perspective, whether such a substitution is a result of benign misclassification or of calculated recharacterization would imply different compliance enhancement strategies. Education and taxpayer services would be essential to address the former scenario, while review on the deductibility link between business and non-business expenses would be effective in dealing with the latter scenario.

Non-Reporting of Schedule C Business Receipts among Timely Non-Business Filers

Timely non-business returns had higher NMP (34.0 percent) but lower NMA ($1,239) estimates for nonfarm sole proprietor income than their business return counterparts (20.0 percent and $5,108, respectively). The differences between business and non-business timely returns in both measures are **significant**. This reflects substantial noncompliance in reporting business income within timely non-business returns despite the relatively small amount of Schedule C income involved.

This is may be due to the non-reporting of nonfarm business income pertaining to "informal suppliers", who should have reported their Schedule C income but chose not to report it all.[10] In one sense, these noncompliant informal suppliers chose to hide all their gross business receipts by only reporting non-business income, which translates to higher NMP and lower NMA estimates in Schedule C income for non-business returns than their business counterparts.

Our preliminary examination shows that about 25 percent of the misreported Schedule C income for timely non-business returns was due to the non-reporting of gross business receipts by informal suppliers. Having excluded these cases, the resulting NMP estimate would become much closer to that of timely business returns.

The informal supplier type of reporting noncompliance of Schedule C income represents a new challenge in our detection and enforcement efforts. To effectively address this issue would require a thorough examination of both business and non-business aspects of Schedule C income reporting. It also requires a new detection mechanism for this rising segment of noncompliance.

Disallowed-In-Full EITC Claims

The reporting noncompliance of the earned income tax credit EITC is the highest among all income and offset items across all returns (e.g., NMP of 50.5 percent for all timely filed returns). Moreover, delinquent non-business returns had significantly higher NMP estimate than their timely counterparts (115.6 percent versus 50.1 percent, respectively). This is largely attributed to an overwhelming portion of "disallowed-in-full" EITC cases among delinquent non-business returns.[11]

The tax law required TY 1988 filers to meet the eligibility requirements, which included correct filing status, sufficient number of eligible dependent children, and correct earned

TABLE 1
Selected Noncompliance Measure Estimates
TY 1988 Timely Filed Returns

Form 1040 Line Item	Net Misreporting Percentage (%)			Net Misreporting Average ($)		
	Non Business	Business	All	Non Business	Business	All
Positive Income	**0.46%**	**2.31%**	**0.52%**	**$121**	**$359**	**$135**
Wages & Salaries	0.14	1.81	0.19	36	333	48
Interest Income	1.42	2.07	1.47	34	60	36
Dividends	3.46	6.72	3.72	101	211	109
State Income Tax Refunds	0.76	1.50	0.83	4	13	5
Alimony Income	5.50	10.08	5.72	335	509	345
Pensions & Annuities	1.91	2.74	1.94	147	216	149
Unemployment Compensation	6.93	5.44	6.88	112	99	111
Social Security Benefits	3.72	12.31	4.18	132	531	149
Loss-Included Income	**11.01**	**17.51**	**13.37**	**1,482**	**6,108**	**2,315**
Capital Gains	6.92	7.58	7.01	756	1,095	793
Form 4797 Income	17.22	15.93	16.75	923	1,010	951
Other Income	20.40	18.66	20.07	1319	2,750	1,454
Nonfarm Sole Proprietors	34.00	20.05	22.23	1,239	5,108	2,923
Farm Income	33.69	21.39	24.05	1,445	3,970	2,595
Rents & Royalties	1.15	0.62	1.06	137	85	129
Partnerships & SBCs	3.30	4.74	3.45	822	961	840
Income Offsets	**4.93**	**0.97**	**4.54**	**389**	**113**	**370**
Statutory Adjustments	6.77	2.99	5.66	143	91	131
Itemized Deductions	4.97	0.22	4.50	573	30	525
Personal Exemptions	4.80	1.34	4.52	195	67	186
Tax Credits	**26.58**	**10.29**	**25.22**	**160**	**61**	**152**
Earned Income Tax Credits	50.06	55.05	50.53	179	190	180
Other Tax Credits	15.42	-15.79	12.97	117	-135	99

TABLE 2
Selected Noncompliance Measure Estimates
TY 1988 Secured Delinquent Returns

Form 1040 Line Item	Net Misreporting Percentage (%)			Net Misreporting Average ($)		
	Non Business	Business	All	Non Business	Business	All
Positive Income	**1.34%**	**7.97%**	**2.00%**	**$239**	**$684**	**$323**
Wages & Salaries	0.55	5.08	0.94	106	512	169
Interest Income	3.60	14.23	6.33	62	258	110
Dividends	20.20	45.78	23.03	184	315	202
State Income Tax Refunds	16.05	11.17	14.76	65	72	66
Alimony Income	1.00	0.00	0.37	205	0	65
Pensions & Annuities	7.23	6.78	7.20	408	213	389
Unemployment Compensation	4.18	0.00	3.75	87	0	73
Social Security Benefits	0.99	77.47	33.06	70	2,771	1,078
Loss-Included Income	**32.00**	**19.26**	**21.67**	**2,747**	**7,087**	**4,916**
Capital gains	29.31	9.13	13.17	1,803	3,903	2,569
Form 4797 Income	21.61	35.46	27.49	3,853	1,260	1,811
Other Income	72.18	-0.88	12.40	4,885	-516	3,041
Nonfarm Sole Proprietors	44.95	30.11	31.13	1,556	6,062	4,714
Farm Income	55.26	72.09	71.59	1,033	16,256	12,221
Rents & Royalties	33.90	-2.25	27.70	1,939	-95	1,494
Partnerships & SBCs	2.60	1.80	2.16	1,078	1,068	1,073
Income Offsets	**12.59**	**0.05**	**8.00**	**673**	**4**	**481**
Statutory Adjustments	27.13	8.93	23.02	842	78	453
Itemized Deductions	21.12	-4.55	11.51	2,210	-576	1,287
Personal Exemptions	7.49	2.35	5.60	256	115	215
Tax Credits	**78.78**	**66.24**	**72.79**	**262**	**205**	**234**
Earned Income Tax Credits	115.59	88.61	101.20	313	244	277
Other Tax Credits	22.10	-2.56	13.13	98	-9	54

TABLE 3
Differences in Selected Noncompliance Measure Estimates
Between TY 1988 Secured Delinquent And Timely Filed Returns

Form 1040 Line Item	Net Misreporting Percentage (%)		Net Misreporting Average ($)	
	Non Business	Business	Non Business	Business
Positive Income	**0.88%**	**5.65%**	**$118**	$325
Wages & Salaries	0.40	3.27	70	179
Interest Income	2.18	12.16	28	198
Dividends	16.74	39.06	83	104
State Income Tax Refunds	15.29	9.67	61	59
Alimony Income	-4.50	-10.08	-130	-509
Pensions & Annuities	5.32	4.04	261	-3
Unemployment Compensation	-2.76	-5.44	-25	-99
Social Security Benefits	-2.74	5.16	-62	2,240
Loss-Included Income	**20.99**	**1.75**	**1,265**	979
Capital gains	22.39	1.55	1,047	2,809
Form 4797 Income	4.38	19.53	2,930	250
Other Income	51.78	-19.54	3,566	-3,266
Nonfarm Sole Proprietors	10.96	10.06	317	954
Farm Income	21.57	50.70	-412	12,286
Rents & Royalties	32.75	-2.86	1,801	-180
Partnerships & SBCs	-0.71	-2.93	256	107
Income Offsets	**7.66**	**-0.91**	284	-109
Statutory Adjustments	20.36	5.94	699	-13
Itemized Deductions	16.15	-4.77	1,637	-606
Personal Exemptions	2.69	1.01	61	49
Tax Credits	**52.20**	**55.95**	**102**	144
Earned Income Tax Credits	65.53	33.56	134	54
Other Tax Credits	6.69	13.23	-18	125

TABLE 4
Differences in Selected Noncompliance Measure Estimates
Between TY 1988 Business And Non-Business Returns

Form 1040 Line Item	Net Misreporting Percentage (%)		Net Misreporting Average ($)	
	Timely Filed	Secured Delinquent	Timely Filed	Secured Delinquent
Positive Income	**1.86%**	**6.63%**	**$238**	**$445**
Wages & Salaries	1.67	4.53	297	406
Interest Income	0.65	10.63	24	196
Dividends	3.26	25.58	110	131
State Income Tax Refunds	0.73	-4.88	9	7
Alimony Income	4.57	-0.99	174	-205
Pensions & Annuities	0.84	-0.45	69	-195
Unemployment Compensation	-1.49	-4.18	-13	-87
Social Security Benefits	8.59	76.48	399	2,701
Loss-Included Income	**6.50**	**-12.75**	**4,626**	**4,340**
Capital gains	0.66	-20.18	339	2,100
Form 4797 Income	-1.29	13.86	87	-2,593
Other Income	-1.74	-73.06	1,431	-5,401
Nonfarm Sole Proprietors	-13.95	-14.84	3,869	4,506
Farm Income	-12.31	16.83	2,525	15,223
Rents & Royalties	-0.53	-36.14	-52	-2,034
Partnerships & SBCs	1.44	-0.79	139	-10
Income Offsets	**-3.97**	**-12.54**	**-276**	**-669**
Statutory Adjustments	-3.78	-18.20	-52	-764
Itemized Deductions	-4.76	-25.67	-543	-2,786
Personal Exemptions	-3.47	-5.14	-128	-141
Tax Credits	**16.29**	**-12.55**	**-99**	**-57**
Earned Income Tax Credits	4.99	-26.98	11	-69
Other Tax Credits	-31.21	-24.66	-251	-107

income type and threshold. For example, an erroneous inclusion of interest income for the earned income calculation resulted in partial reduction (not claimed but established) of EITC. More often, however, an ineligible filing status (e.g., single or married filing separately) resulted in total reduction (disallowed-in-full) of EITC.

Our examination of all the returns claiming EITC, both delinquent and timely, indicates that while an overwhelming high percent of noncompliance EITC ended up as disallowed-in-full, this problem is most pronounced in delinquent non-business returns.

To address this noncompliance problem would require simplifying the EITC requirements and extend education efforts on EITC for delinquent non-business filers, since those filers are generally poor and least informed segment of the entire population. They are more likely to be erroneous in meeting the eligibility requirements and end up in disallow-in-full.

The major expansion to the EITC program, as enacted in the *Omnibus Budget Reconciliation Act of 1990*, has eased the eligibility requirements to include individuals with "**single**" filing status and a qualifying child. In addition, the *Omnibus Budget Reconciliation Act of 1993* extends the EITC benefit for the first time to those low-income workers who do not have any qualifying children. These changes will likely have positive impact on EITC reporting compliance.

Conclusion

This article incorporates our recently-developed line item-based measures to analyze reporting noncompliance issues for individual income tax returns. It presents the measure estimates developed through the TCMP survey data for both TY 1988 timely filed and secured delinquent returns.

The findings reflect two general compliance pattern. First, business returns are more compliant in reporting income offsets and positive income, but less compliant in reporting loss-included income in comparison with non-business returns. Second, timely returns are more compliant in reporting positive income than their delinquent counterparts.

The findings also show that loss-included income accounts for more noncompliance than positive income, and tax credits account for more noncompliance than income offsets. In particular, underreporting nonfarm sole proprietor income and overstating EITC represent two of the more serious compliance problems and each reflects different natures of reporting noncompliance.

For overstating EITC offset, the dominant pattern involves disallowed-in-full claims due to incorrect number of dependent children or ineligible filing status.

Two patterns of underreporting Schedule C income seemingly emerged from our findings. For business returns, as evidenced in the delinquent returns, reporting noncompliance takes the form of overstating business expenses, sometimes with certain substitution for non-business deductions. For non-business returns, as evidenced in the timely returns, reporting noncompliance involves non-reporting of business receipts.

To fully understand the nature and ascertain the significance of these distinct forms of reporting noncompliance and address appropriate strategies would require thorough and intensive data analyses, which would warrant an extension in modeling reporting noncompliance and future empirical research in this area.

Endnotes

[1]An advantage of replacing voluntary compliance measures with noncompliance measures is that the differences in the tax gap estimates and the differences in corresponding noncompliance estimates will be positively related. We also should note two things about the NMT estimates. First, these estimates do not reflect any **unreported income** that was not detected by the TCMP audits. Second, they do not reflect the ultimately assessed values for what should have been reported after all appeals and litigation have been completed.

[2]The NMP and NMA are consistent in that both measures exclude those taxpayers who reported and should have reported zero amounts for a given line item.

[3]Graeber, Michael J. , Bonnie L. Nichols, and D. Arthur Sparrow, "Characteristics of Delinquent Returns," **The IRS Research Bulletin,** 1992, pp. 37-46.

[4]Ho, Chih-Chin and Carol E. Sattler, "Developing Measures of Reporting Compliance for Individual Tax Returns," **The IRS Research Bulletin**, 1992, pp. 53-57.

[5]Since the net misreporting percentage (NMP) is a ratio estimator and the comparison requires variance estimates for these NMPs. The variance estimation method of such a ratio estimator is based on the procedures outlined in Cochran, W.G., **Sampling Techniques** (third edition), (New York: John Wiley & Sons, 1977), pp. 164-166.

[6]The only exception is alimony income, which is not subject to withholding nor is covered under the IRP.

[7]Rents and royalties, prizes and awards, and receipts of many types of non-employment compensation such as crop insurance payments and golden parachute payments are reported on Forms 1099-MISC, miscellaneous income. Prizes and awards, as a part of other income, are also subject to backup withholding.

[8]For capital gains, taxpayers are allowed to report losses up to $3,000. For Form 4797 income and other income, the negative values arise from losses in selling business equipments and from carry-forwards of earlier years' net operating losses, respectively.

[9]The only exception is Form 4797 income. The NMP differences between delinquent and timely returns (Table 3) and the NMP differences between business and non-business returns (Table 4) are not significant at a 95% confidence level.

[10]Informal suppliers are individuals who provide products or services through informal arrangements which frequently involve cash-related transactions. Child-care providers, moonlighting professionals, and street-side vendors are among this type of nonfarm sole proprietors.

[11]For example, almost one in two cases claiming EITC ended in disallowed-in-total. In other words, half of EITC claims were fully compliant and the other half are totally disallowed, leaving very few cases in between (partial reduction).

Voluntary Compliance With The Individual Income Tax: Results From the 1988 TCMP Study

by Charles W. Christian

Voluntary compliance by individuals who filed returns for tax year 1988 increased by 1.2 percentage points to 92.7 percent compared to tax year 1985 as measured by the traditional Taxpayer Compliance Measurement Program methods. However, an estimated 40 percent of these returns had an understatement of tax totalling over $32 billion. Compliance continues to vary across examination classes and regions with high income nonbusiness returns and the Central and Mid-Atlantic Regions having the highest compliance, and nonfarm sole proprietors and the Western Region having the lowest. For those returns with tax understatements, lack of substantiation and lack of knowledge were the two most common reasons indicated by examiners as the reason for their recommended adjustment.

Introduction

The Taxpayer Compliance Measurement Program (TCMP) Phase III surveys of individual income tax returns (Forms 1040, 1040A, and 1040EZ) began with tax year (TY) 1963 returns that were filed during 1964. The most recent sample from Cycle 10 was drawn from TY88 returns filed during 1989, and examinations of 54,088 returns were completed in 1991. Returns were randomly selected for Cycle 10 by taxpayer identification number from ten mutually exclusive examination classes, so they are representative of the population of filed returns. Cycle 10 provides the first random sample of returns examined after the Tax Reform Act of 1986 (TRA86), which made significant changes in both tax rates and the tax base. Cycle 10 also contains "reason codes" assigned by tax examiners for recommended tax increases.

The objectives of this article are 1) to estimate the reporting accuracy of TY88 individual income tax returns compared to prior years, 2) to analyze variations in both the frequency and magnitude of noncompliance across return characteristics, and 3) to describe the principal reasons reported by tax examiners for recommending assessments.

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Traditional Compliance Measures

The following tables provide estimates of the Voluntary Compliance Level (VCL) for TY88 compared to prior years. The VCL is defined as the ratio of the total tax liability reported to the sum of the total tax liability reported and the tax increase recommended after examination, times 100. Some of the following tables also report results in terms of the Voluntary Reporting Percentage (VRP). The VRP is the ratio of 1) the amount reported on the return to, 2) the amount determined to be correct upon examination, times 100. The VCL and VRP reflect measures of voluntary compliance traditionally used in TCMP analyses. These measures enable comparisons to be made with prior year results. However, these measures have certain limitations including the fact that they focus solely on how accurately information (such as income, expenses, etc) is reported on returns. They do not address issues of nonfiling nor nonpayment. As a result, IRS has developed additional measurement concepts in more recent years that incorporate TCMP results but better reflect the broader aspects of compliance. The most significant of these new measures is the "tax gap" which broadly speaking, is the difference between taxes voluntarily paid and total taxes truly owed. Discussion of the tax gap and other research measurements is beyond the scope of this paper which is primarily the latest installment in a series of articles on VCL trends.[1]

Trends in Voluntary Compliance 1963-1988

As shown in Table 1, the VCL increased from 91.5 for TY85 to 92.7 for TY88, the highest measured level since 1969.[2] That represents a 14 percent drop in noncompliance as measured by the complement of the VCL. Although tax understatements increased to an estimated $32.3 billion, a 6.6 percent increase, that is one-third less than the 9.9 percent increase in consumer prices during the period

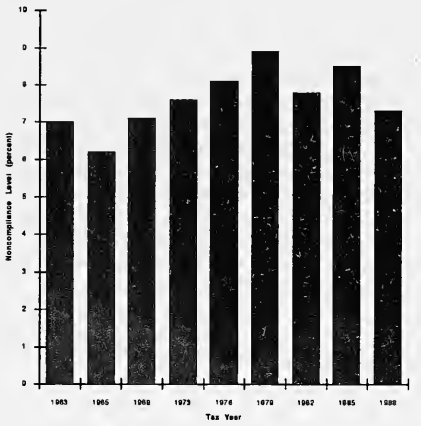
Figure 1 graphically shows the trend in noncompliance over the last quarter-century. Notwithstanding the apparent increase in voluntary compliance, an estimated 40 percent of the returns filed for TY88 had an understatement of tax averaging $780. However, 48 percent of these returns had a tax increase of less than $200, and only 10 percent had an increase greater than $1,500.

Table 1
Trends in Voluntary Compliance Levels and Tax Understatement (dollars in billions)

Tax Year	VCL	Noncompliance Level (100-VCL)	Tax Understatement
	(1)	(2)	(3)
1963	93.0	7.0	$ 3.2
1965	93.8	6.2	$ 3.0
1969	92.9	7.1	$ 5.9
1973	92.4	7.6	$ 8.3
1976	91.9	8.1	$11.8
1979	91.1	8.9	$21.4
1982	92.2	7.8	$23.5
1985	91.5	8.5	$30.3
1988	92.7	7.3	$32.3

Note: To compensate for the lack of information return transcripts and to improve comparability, VCLs for years prior to 1979 have been reduced by 0.6 percent.

Figure 1
Trends in Noncompliance Levels
(100 minus Voluntary Compliance Level)



VCLs are not strictly comparable over time because information returns were not always available and penalties were included in tax increases prior to 1982. VCLs of prior years have been recalculated excluding penalties, and adjustments have been made to mitigate the effects of information returns.[3]

To keep the trend in voluntary compliance in context, the impact of TRA86 and changes in economic conditions should be considered.[4] The increase in the standard deduction and the elimination or restriction of several itemized deductions resulted in 7.9 million fewer itemized returns for TY88 compared to TY85. The proportion itemizing dropped from 39.2 percent to 29.1 percent. Perhaps just as importantly, claims for partnership and S corporation losses (net of IRC §469 passive loss limits) dropped by $7.2 billion.

TRA86 also reduced tax rates: between 1985 and 1988 the top marginal rate declined from 50 percent to 28 percent (to 33 percent including the surcharge for higher income taxpayers). The average effective tax rate, defined as tax divided by adjusted gross income, fell from 14.4 percent to 13.8 percent. However, the number of returns with tax due at filing increased from 20.9 percent to 24.8 percent.

Macroeconomic conditions also improved during the period. The unemployment rate fell from 7.2 percent to 5.5 percent, and the gross domestic product grew by 11.4 percent between 1985 and 1988 after adjusting for inflation.

Trends in Voluntary Compliance by Examination Class

Table 2 shows that compliance improved for both "nonbusiness" and "business" returns. Considerable variation exists across examination classes with VCLs ranging from a low of 63.9 for lower income nonfarm sole proprietors to 96.6 for higher income nonbusiness returns.

Table 2
Trends in Voluntary Compliance Level By Examination Class

Examination Class	1982	1985	1988
	(1)	(2)	(3)
Total	92.2	91.5	92.7
Nonbusiness	93.6	93.1	94.5
TPI<$25000 (1040A type)	93.1	92.4	87.6
TPI<$25000	89.8	85.6	85.9
$25000≤TPI<$50000	94.6	92.8	94.4
$50000≤TPI<$100000	94.6	94.7	95.7
TPI≥$100000	93.7	95.3	96.6
Business	75.7	76.5	79.9
Schedule C			
TGR<$25000	65.6	60.8	63.9
$25000≤TGR<$100000	74.7	71.0	76.5
TGR≥$100000	77.8	81.8	83.7
Schedule F			
TGR<$100000	75.2	75.1	76.6
TGR≥$100000	81.7	82.3	82.5

Note: TPI = Total Positive Income
TGR = Total Gross Receipts

The relationship between nonbusiness and business returns has been stable over time. Within nonbusiness classes, the largest increases in compliance are concentrated in the middle and high income returns, but a decline in compliance was observed for the 1040A-type returns. Within the business classes, compliance improved in every examination class with the largest increase in middle income Schedule C returns.[5]

Table 3
Trends in Voluntary Compliance Level
By Region

IRS Region	1965	1969	1973	1976	1979	1982	1985	1988
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Southeast	92.2	90.6	90.2	89.9	88.7	91.0	91.3	92.1
Midwest	94.6	93.5	93.8	93.6	91.3	93.2	92.7	93.4
Central	95.7	95.2	94.8	93.3	94.0	93.8	94.3	94.3
Southwest	92.7	91.8	92.2	91.5	89.9	90.7	91.3	92.9
North Atlantic	94.4	93.9	92.9	93.2	93.2	92.1	91.0	93.3
Mid Atlantic	95.2	94.4	94.9	94.0	91.7	93.4	92.5	94.0
Western	94.0	91.4	90.6	90.4	88.6	89.3	88.5	90.1

Trends in Voluntary Compliance and Error Rates by Region

Variation in voluntary compliance across regions has long been observed, and Central Region continues to have a higher than average VCL of 94.3, while Western Region continues to be lower with a VCL of 90.1, as shown in Table 3.[6]

Table 4 provides the percentage overstating and the percentage understating tax, in addition to the VCL. The percentage overstating (understating) tax is the number reporting more (less) total tax liability than was determined to be correct on examination. The percentage overstating tax provides a rough benchmark for the magnitude of unintentional errors.

Table 4
Voluntary Compliance Level and Error Rates
By Region for TY 1988

IRS Region	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
Southeast	6.6%	40.7%	92.1	±1.4
Midwest	7.0%	39.7%	93.4	±0.8
Central	8.6%	33.9%	94.3	±1.0
Southwest	7.0%	39.6%	92.9	±1.6
North Atlantic	6.5%	41.7%	93.3	±1.3
Mid Atlantic & Int'l	7.3%	37.1%	94.0	±1.4
Western	7.6%	43.9%	90.1	±1.8

Note: "Error" = approximate 95 percent confidence interval for VCI.

Estimates of regional VCLs are based on smaller samples than the national level VCLs, so they are less precise. Although the estimates are based on a random sample, a different sample would produce different estimates. In Table 4 and the following tables, the approximate margin of error at a 95 percent level of confidence is labeled "error." It can be seen that some of the differences in VCLs are the result of sampling variation and are not statistically significant.[7]

Voluntary Compliance and Error Rates by Filing Status

Table 5 reports error rates and the VCL for each filing status. The percentage understating tax ranges from a low of 28.3 percent for single to 60.6 percent for married filing separately. The VCL of 81.2 also reflects lower compliance for married filing separately.

Table 5
Voluntary Compliance Level and Error Rates
By Filing Status for TY 1988

Filing Status	Oversteting Tax	Understeting Tax	VCL	Error
	(1)	(2)	(3)	(4)
Single	5.0%	28.3%	91.8	±1.4
Married Joint	9.5%	51.0%	93.4	±0.5
Married Separate	3.5%	60.6%	81.2	±6.8
Head of Household	8.1%	38.6%	90.6	±2.2
Qualifying Widow(er)	8.7%	33.2%	89.0	±17.7

Note: "Error" = approximate 95 percent confidence interval for VCI.

Only 41 returns in the sample are from qualifying widows or widowers, so the estimated error rates and VCL are not very precise.

Voluntary Compliance and Error Rates by Prepayment Position

One of the most striking differentials in voluntary compliance is observed in Table 6 for prepayment condition (refund vs. balance due) as determined after examination. The relationship was first noted by Clotfelter in 1983 and later described more fully by Chang and Schultz in 1990.[8] It holds across examination classes and filing statuses.

Table 6
Voluntary Compliance Level and Error Rates By Prepayment Position for TY 1988

Prepeyment Position (per examination)	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
Balance Due	7.0%	58.0%	88.8	±0.8
Even	2.8%	1.4%	98.0	±2.4
Refund	7.5%	32.6%	96.8	±0.3

Note: "Error" = approximate 95 percent confidence interval for VCI.

The relationship between voluntary compliance and prepayment position has been explained in terms of "Prospect Theory," which suggests that individuals are less risk-averse in situations they perceive to involve "losses" rather than "gains."[9] The application of prospect theory is premised on the assumption that taxpayers perceive a balance due as a loss, and therefore they take more "risky" positions when reporting income and deductions. However, it is possible that the observed association is the result of the joint decision to underreport and underwithhold rather than the effect of underwithholding on underreporting.

Voluntary Compliance and Error Rates by Preparation Mode

Almost half (47.5 percent) of all returns filed for TY88 were prepared by paid preparers, which exceeds the proportion of returns filed by the taxpayer (41.6 percent). Table 7 shows that voluntary compliance for paid-prepared returns as measured by the VCL ranges from 88.5 for "Other" to 94.3 for "CPA" prepared returns, although some of the differences across types of preparers are within the margin of error.[10] It is likely that some of the compliance differences reflect differing levels of return complexity across preparation modes. Also, it is difficult to determine the effect of preparers on compliance because taxpayers "self-select" preparation mode. It is possible that the level of compliance influences their decision to engage a preparer.[11]

Table 7
Voluntary Compliance Level and Error Rates By Preparation Mode for TY 1988

Preparation Mode (percent of returns)	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
Taxpayer (41.6)	6.0%	34.9%	94.0	±0.5
IRS (0.3)	4.4%	44.1%	90.4	±5.5
VITA/TCE (0.7)	6.8%	24.5%	93.7	±3.1
Other Unpaid (9.9)	5.4%	30.5%	90.5	±2.0
CPA (13.9)	11.2%	49.7%	94.3	±0.7
Attorney (1.0)	12.9%	46.2%	89.8	±2.6
National Tax Service (7.9)	6.8%	38.3%	93.6	±1.0
Other Paid (24.7)	7.6%	46.6%	88.5	±1.2

Note: "Error" = approximate 95 percent confidence interval

Evidence from earlier TCMP data suggests that preparers are "rule enforcers" but "ambiguity exploiters."[12] More recent research indicates that, after controlling for the self-selection of preparation mode and differences in return characteristics, the frequency of noncompliance is no different across preparation modes, but the magnitude is larger.[13] Also, there is some evidence that the determinants of compliance may depend not only on preparation mode but also on taxpayer motivations for seeking preparation services.[14]

Voluntary Compliance and Error Rates by Age Group

Voluntary compliance is highest among returns from the young and the elderly as shown in Table 8. Only 19.2 percent of the returns from those age 14 to 25 understated tax, and returns from those 65 and over have the highest VCL. Few returns are available for those under the age of 14, so the estimated VCL is imprecise.

Table 8
Voluntary Compliance Level and Error Rates By Age Group for TY 1988

Age Group	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
AGE < 14	7.9%	24.0%	87.0	±9.1
14 ≤ AGE < 25	3.0%	19.2%	93.0	±1.8
25 ≤ AGE < 45	7.7%	47.1%	92.1	±0.6
45 ≤ AGE < 65	9.4%	49.8%	92.8	±0.8
65 ≤ AGE	7.9%	29.8%	94.7	±1.5

Note: For married couples filing jointly, age is for the primary taxpayer.
"Error" = approximate 95 percent confidence interval for VCI.

Figures 2 and 3 plot VCL and percentage with tax understatement, respectively, by age. Although the estimates are much more variable for low and high age groups because they are based on fewer returns, the association is clear: middle aged taxpayers have lower VCLs and are more likely to understate tax liability than the young or elderly. However, part of this variation is likely to be explained by differences in level of income and return complexity across age groups. Also, it is not possible to determine if the lower compliance infers an age effect or a "generational" effect because these returns were drawn from a single year.[15]

Figure 2
Voluntary Compliance Level by Age

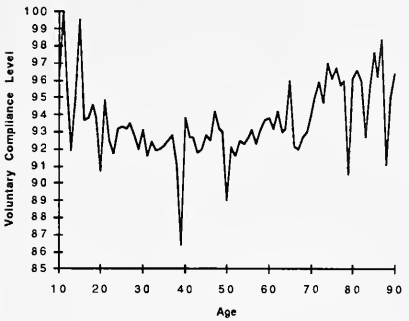
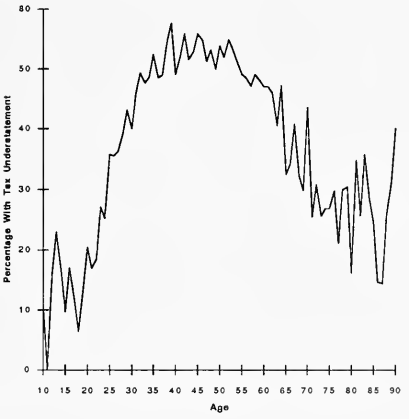


Figure 3
Tax Understatement by Age



Voluntary Compliance and Error Rates by Marginal Tax Rate

Considerable debate exists over the effect of the marginal tax rates on compliance. Early theoretical research found reasons for both higher and lower compliance as the tax rate for an additional dollar of income rises, although more recent work that accounts for strategic return selection concludes that higher tax rates will actually improve voluntary compliance.[16] The first published study based on TCMP concluded that higher tax rates are associated with lower voluntary compliance.[17]

Table 9 shows mixed results in this regard. The compliance levels as measure via the VCL tend to improve as the marginal rates increase up to 28 percent. (Note, the 21 percent rate results from the alternative minimum tax). However, the VCL at the 33 percent marginal rate is lower than that measured at the 28 percent rate.

Table 9
Voluntary Compliance Level and Error Rates By Marginal Tax Rate for TY 1988

Marginal Tax Rate	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
15 Percent	6.2%	40.8%	89.9	±0.4
21 Percent	15.4%	60.2%	92.4	±3.1
28 Percent	11.2%	53.1%	94.2	±0.6
33 Percent	13.7%	62.8%	92.0	±0.6

Note: "Error" = approximate 95 percent confidence interval for VCL.

Of course, tax rates are strongly associated with income, so it is difficult to sort out the separate effects of the two.

Voluntary Compliance and Error Rates by Income Group

Table 10 shows that the relationship between voluntary compliance and income depends on how compliance is measured. If the "frequency" of noncompliance based on the percentage understating tax is examined, signs of a classic inverted "U" relationship are observed: compliance is lowest for middle income returns and higher for both low and high income returns. On the other hand, if the VCL is examined, compliance is lowest for low income returns, particularly the $5,000 - $10,000 group.

Table 10
Voluntary Compliance Level and Error Rates By Income Group for TY 1988

Income Group	Overstating Tax	Understating Tax	VCL	Error
	(1)	(2)	(3)	(4)
AGI < $0	5.4%	11.9%	84.1	±6.9
0 ≤ AGI <$5,000	3.2%	11.0%	84.2	±3.4
$5,000 ≤ AGI < $10,000	4.7%	29.4%	78.7	±1.9
$10,000 ≤ AGI < $25,000	5.2%	38.2%	88.8	±0.5
$25,000 ≤ AGI < $50,000	9.5%	52.0%	92.4	±0.3
$50,000 ≤ AGI < $100,000	14.0%	60.0%	93.2	±0.3
$100,000 ≤ AGI < $250,000	14.6%	65.9%	91.3	±0.7
$250,000 ≤ AGI < $500,000	16.5%	62.8%	95.7	±0.5
$500,000 ≤ AGI	18.5%	58.5%	97.1	±0.7

Note "Error" = approximate 95 percent confidence interval for VCL

The variation in the percentage overstating tax is consistent with a complexity explanation: as income rises, the return becomes more complex, and more unintentional errors are made.

Specific Line Items

The preceding analysis focused on voluntary compliance with reporting total tax liability. The following sections examine filing status and six specific line items: total income, total "statutory" adjustments, itemized deductions, number of dependents, total exemptions, and total credits.

Voluntary Compliance by Filing Status

Table 11 reports the estimated number of TY88 returns claiming each filing status cross-tabulated by the filing status allowed after examination. The table shows the frequency of changes associated with each filing status and the percentage of returns subject to change.

Table 11
Filing Status Per Return and Examination
(percentage of returns)

Filing Status (per return)	Filing Status (per examination)				
	Single	Joint	Seperate	H of H	Widow(er)
	(1)	(2)	(3)	(4)	(5)
Single	88.9%	0.0%	0.8%	0.3%	0.0%
Married (Joint)	0.1%	99.7%	20.0%	0.1%	0.0%
Married (Separate)	4.5%	0.0%	94.4%	1.2%	0.0%
Head of Household	27.3%	0.0%	5.0%	67.6%	0.1%
Qualifying Widow(er)	2.9%	0.0%	0.0%	26.0%	71.0%

The table clearly reflects the high error rate for returns claiming head of household and qualifying widow(er) filing status. Almost one-third of all returns claiming head of household are reclassified after examination, most commonly to the single filing status. Approximately 29 percent of returns claiming qualifying widow(er) are also reclassified, most commonly to head of household.

Trends in Voluntary Reporting Percentages

Table 12 reports the Voluntary Reporting Percentage (VRP) for six line items for TY82, TY85, and TY88. The VRP is the ratio of 1) the amount reported on the return to, 2) the amount determined to be correct upon examination, times 100. VRPs below 100 reflect net underreporting of income items, and VRPs over 100 reflect net overreporting of substraction items (e.g. such as overstating itemized deductions).[18]

In TY88 total income was understated 3.2 percent (100 percent minus 96.8 percent), approximately the same as in prior years. Compliance with reporting statutory adjustments, itemized deductions, and total exemptions is also relatively stable. However, compliance in reporting total dependents shows a significant improvement between TY85 and TY88, with the VRP falling from 117.0 to 113.8. This improvement coincides with TRA86 requiring taxpayers to report social security numbers for dependents. On the other hand, compliance appears to decline in reporting total credits; the VRP increased from 111.4 to 113.0.

Table 12
Trends in Voluntary Reporting Percentages
Selected Line Items for TY 1988

Line Item	1982	1985	1988
	(1)	(2)	(3)
Total Income	97.0	98.9	**96.8**
Statutory Adjustments	104.5	108.1	**105.6**
Itemized Deductions	104.1	105.5	**105.8**
Total Dependents	ns	117.0	**113.8**
Total Exemptions	104.7	104.4	**104.5**
Total Credits	ns	111.4	**113.0**

Note: ns = not available

Principal Reasons For Recommended Adjustment

Examiners were asked to indicate the "principal reason for tax change" on the checksheet for each return if 1) the change did *not* result in a penalty for negligence or fraud, and 2) an inadequate records notice was *not* warranted. Six categories of reasons were provided to examiners, and they responded on 29,788 out of 32,301 cases with a recommended tax increase, which represent over 40 million returns in the population. The six reasons are:

- An Issue Open to Multiple Interpretation
- Lack of Substantiation
- Incorrect Accounting or Computational Procedures
- Relied Upon the Preparer for His/Her Return Preparation and Was Not Involved in the Process
- Lacked the Knowledge of Tax Laws to Prepare an Accurate Return
- Other

Table 13 provides the percentage of returns with a tax increase by reason for all taxpayers and also for each examination class. Overall, lack of substantiation and lack of knowledge were the two most common reasons, together accounting for 45.6 percent of the changes. Surprisingly, examiners indicated that multiple interpretations were the reason for only 3.4 percent of the recommended tax changes.

Table 13
Reasons for Recommended Adjustment
By Examination Class for TY 1988
(percentage of returns with reason code)

Examination Class	Multiple Interpretation	Lacks Substance	Inaccurate Accounting	Relied on Preparer	Lack of Knowledge	Other
	(1)	(2)	(3)	(4)	(5)	(6)
TPI≤$25000 (1040A)	1.4	16.1	10.5	10.3	37.6	24.0
TPI≤$25000	3.1	19.1	17.0	16.7	22.9	19.2
$25000≤TPI≤$50000	2.6	26.3	17.2	18.0	20.4	15.3
$50000≤TPI≤$100000	5.2	29.4	21.0	13.7	16.5	14.2
TPI≥$100000	8.4	16.7	28.3	17.6	8.5	16.6
Schedule C						
TGR≤$25000	3.0	27.0	19.6	23.0	18.3	9.1
$25000≤TGR≤$100000	5.0	23.6	30.4	19.1	13.4	9.6
TGR≥$100000	8.4	14.4	35.4	23.1	9.9	10.9
Schedule F						
TGR≤$100000	4.6	12.2	39.2	24.6	12.5	6.8
TGR≥$100000	7.7	6.8	47.3	19.4	9.3	9.6
Overall	3.4	23.4	16.3	15.7	22.2	17.0

The reasons for tax change vary systematically across examination classes. Lack of knowledge was the dominate reason for tax change in the 1040A-type and other low income nonbusiness examination classes. This reason consistently becomes less important as income rises. Inaccurate accounting procedures was the most prevalent reason for the highest income groups, both business and nonbusiness. The latter reason was associated with almost half of all high income farm returns.

Limitations

The preceding article presented a summary of the major results of the TY88 TCMP relative to findings in prior years. It also independently examined several factors that potentially are determinants of voluntary compliance, and several significant associations were observed. However, compliance is a complex function of many factors, including many that are unobservable from tax return data. Therefore, some of the observed associations may not reflect causal relationships.

Several limitations also are inherent in using VCL as a measure of voluntary compliance. The VCL reflects both intentional and unintentional misreporting, and TCMP Phase III, Cycle 10 does not provide information on nonfilers. Also, VCL is computed from *recommended* tax increase, but the actual adjustment to tax may be amended through appeals and litigation. Further, it is possible that exam efficiency and detection rates vary systematically across factors, which would result in observed differences that are not associated with taxpayer compliance. Finally, the VCLs (and Tax Understatements) are estimated from random samples, so small differences between years may reflect sampling variation rather than differences in the population.[19]

Endnotes

[1]Compliance estimates for prior years are from Fratanduono and Bucci, "Trends in the Voluntary Compliance of Taxpayers Who File Individual Income Tax Returns," **Trend Analyses and Related Statistics**, 1989. The VCL is only one of many measures of compliance, but it has the advantage of comparability to prior TCMP estimates. For an alternative measure of noncompliance, the "Net Misreporting Percentage," see Chih-Chin Ho, "Reporting Noncompliance Evidence From Timely Filed and Secured Delinquent Individual Tax Returns" in this issue of **The IRS Research Bulletin**.

[2]While the specific 1988 result indicates an improvement in voluntary compliance compared to 1985, it must also be noted that TCMP results are only estimates. They are subject to both sampling and non-sampling error which contribute to some of the differences observed over time. This article chooses to describe 1988 as an increase based on the specific measurements recorded. However, a more cautious interpretation of the results in Table 1 would be to describe the voluntary compliance level as "constant" or "unchanged" over the past two decades.

[3]Bird, Michael D., "Business Cycles and Individual Income Tax Compliance," **Trend Analyses and Related Statistics**, 1986, pp. 39-42.

[4]Changes in return characteristics are from Internal Revenue Service, **SOI Bulletin**, Fall 1990 and Fall 1991.

[5]An analysis of nonfarm business returns by Principal Business Activity is available in Charles W. Christian, "Compliance of Sole Proprietors–Findings From 1988 TCMP Phase III, Cycle 10," **The IRS Research Bulletin**, 1992, pp. 23-28.

[6]Regional VCLs for 1965-1982 are from G. Koteen, "Regional Trends in Individual Voluntary Compliance Levels for 1965-1982," **Trend Analyses and Related Statistics**, 1986. Those from 1985 are from TCMP Phase III, Cycle 9.

[7]An exact margin of error is difficult to calculate because the VCL is a ratio (sum of reported tax to sum of reported tax plus recommended increases) that is estimated from a stratified sample. The tables use an approximation of the margin of error that is described in W. Cochran, **Sampling Techniques** (New York: John Wiley and Sons), 1977, p. 153. It provides insight into differences in VCLs that are likely not just a product of sampling variation.

[8]Clotfelter, Charles T., "Tax Evasion and Tax Rates: An Analysis of Individual Returns," **The Review of Economics and Statistics**, August 1983, pp. 363-373; Chang, Otto H. and Joseph J. Schultz, Jr., "The Income Tax Withholding

Phenomenon: Evidence From TCMP Data," **The Journal of the American Taxation Association**, Vol. 12, No. 1, Fall 1990, pp. 88-93.

[9]For discussion of this issue see:

Dusenbury, Richard,"The Effects of Prepayment Position On Individual Taxpayers' Preferences for Risky Tax-Filing Options." **The Journal of the American Taxation Association**, Vol. 16, No. 1, Spring 1994, pp. 1-16;

Martinez-Vazquez, Gordon B. Harwood, and Ernest R. Larkins, "Withholding Position and Income Tax Compliance: Some Experimental Evidence," **Public Finance Quarterly**, Vol. 20, No. 2, April 1992, pp. 152-174;

A. Schepanski and D. Kelsey, "Testing for Framing Effects in Taxpayer Compliance Decisions," **The Journal of the American Taxation Association**, Vol. 12, No. 1, Fall 1990, pp. 60-77;

Schadewald, Michael S., "Reference Point Effects in Taxpayer Decision Making," **The Journal of the American Taxation Association**, Vol. 10, No. 2, Spring 1989, pp. 85-93;

Jackson, Betty R. and Michael W. Spicer, "An Investigation of Under- or Overwithholding of Taxes on Taxpayer Compliance," **Arthur Young Tax Research Grant Report,** October 1986.

[10]According to the **IR Manual**–Training 3181-033 (Rev. 6-90)–Exhibit 4860-8, p. 4800-76, returns are classified as "IRS Prepared" when IRS prepared the return for the taxpayer. "Prepared, but not audited IRS" is stamped on the bottom of the return (return coded "P").

[11]Erard, Brian, "Taxation With Representation - An Analysis of the Role of Tax Practitioners in Tax Compliance," **Journal of Public Economics,** 52, 1993, pp. 163-197.

[12]Klepper, S., and D. Nagin, "The Role of Tax Practitioners in Tax Compliance," **Policy Sciences**, Vol. 22, 1989, pp. 167-194.

[13]Erard, *ibid.*

[14]Collins, Julie H., Valerie C. Milliron, and Daniel R. Toy, "Determinants of Tax Compliance: A Contingency Approach," **The Journal of the American Taxation Association**, 14(2), 1992, pp. 1-2

[15]Many observers believe that compliance varies across generations, or cohorts, because they have common experiences and values, not because they are of different ages.

[16]Allingham, Michael G. and Agnar Sandmo, "Income Tax Evasion: A Theoretical Analysis," **Journal of Public Economics**, Vol. 1, 1972, pp. 323-338; Reinganum, Jennifer F. and Louis L. Wilde, "Income Tax Compliance In A Principal-Agent Framework," **Journal of Public Economics**, Vol. 26,1985, pp. 1-18.

[17]Clotfelter, *ibid.*

[18]See Chih-Chin Ho, Reporting Noncompliance Evidence From Timely Filed and Secured Delinquent Individual Tax Returns" in this issue of **The IRS Research Bulletin** for an alternative to VRPs, the "Average Underreporting Liability," which estimates the effect of misreporting specific line items on tax liability.

[19]For a comprehensive overview of compliance research see Jeffrey A. Roth, John T. Scholz, and Ann Dryden Witte, eds., "Understanding Taxpayer Compliance Self-Interest, Social Commitment, and Other Influences," Chapter 2 in **Taxpayer Compliance–Volume I: An Agenda for Research**, (Philadelphia: University of Pennsylvania Press), 1989. For an excellent collection of papers on compliance issues, see Joel B. Slemrod, ed., **Why People Pay Taxes**, (Ann Arbor, University of Michigan Press), 1992. Henk Elffers, **Income Tax Evasion–Theory and Measurement**, 1991. Kluwer, Deventer, Netherlands, expands on theory relevant to noncompliance and describes experimental tests in tax contexts.

Nonfiling in the Alaska Commercial Fishing Industry

by Alan H. Plumley and David W. Tucker

The nature of the commercial fishing industry encourages noncompliance with the filing of income tax returns—especially in Alaska. The Anchorage District Office of the IRS has launched a Compliance 2000 initiative aimed at improving compliance within this industry. One aspect of this initiative has been a joint effort with National Office Compliance Research to measure the magnitude of the problem, and to develop a database with which to identify and prioritize taxpayer contacts. This research has quantified a significant nonfiling problem—growing from 10.3 percent in 1989 to 13.1 percent in 1990 among permit holders, and from 23.1 percent in 1989 to 27.3 percent in 1990 for crew members. These measurements and the methodology that produced them have laid the groundwork for tracking the impact of district Compliance 2000 activities. Outreach and enforcement efforts have already resulted in assessments of over $9 million in delinquent taxes.

Introduction

The commercial fishing industry represents 1/6 of Alaska's economy and is its largest employer. Over 50,000 Alaska residents and nonresidents derive income from this complex industry. Two of the nation's top three fishing ports—Dutch Harbor and Kodiak—are in Alaska.

Certain characteristics of the work contribute to a frontier atmosphere. The work is exceptionally dangerous. In 1992 alone, 35 fishers died at sea and 87 others were rescued from sinking ships. Overall 44 fishing vessels never made it back to port.

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Weather conditions are often harsh. It is not unusual for crabbers to break ice from rigging with baseball bats to avoid capsizing in rough seas. Halibut fishing is conducted in 24 hour "openings" regardless of weather. These openings have the character of a "land rush" at sea with frantic maneuvering and often cutthroat competition. The industry encompasses the vastness of coastal Alaska, an area of profound geographic and cultural remoteness from mainstream America.

Fish prices fluctuate wildly based on factors as varied as Norwegian farmed salmon, the Japanese economy, and the fickle nature of wild salmon runs in Alaska. Though Seattle-based ocean-going processors dominate some fisheries, the overwhelming number of participants are small entrepreneurs who stake their lives and livelihoods on an ability to catch their share in a highly competitive industry.

Twenty years ago the State of Alaska initiated a limited entry system designed to control access to fisheries in Alaska waters. This was necessary since modern fishing technology could quickly strip everything with a gill from the Gulf of Alaska if not restricted. Now numbering in excess of 14,000, these limited entry permits are now extremely valuable, and are bought and sold on the open market. This permit system created an industry of permit holders who form an elite, and the crew members who assist them. Typically a permit holder owns a fishing vessel and is assisted by up to ten crew members whose pay is a share of the catch. Incomes in the industry are substantial for both permit holders and crew members.

When the vessel off-loads the catch to a processor, a "fish ticket" is issued serving as a receipt for the poundage caught. At the close of the fishing season, the permit holder settles with the processor based upon the aggregate poundage at a predetermined price per pound. The State of Alaska accumulates copies of all fish tickets to monitor the biological health of fish stocks. A Form 1099 is not required to be filed with IRS since the fish ticket payments are for purchase of inventory.

A Recipe for Nonfiling

In the late 1970s, in response to complaints that bookkeeping requirements on permit holders were excessive, Congress exempted the industry from federal income tax withholding on crew shares. This exemption covers vessels having 10 or fewer crew members; in Alaska, this encompasses virtually the entire industry.

The lack of withholding on crew members has made effective tax administration extremely difficult. The industry is now comprised of tens of thousands of self-employed individuals, each responsible for filing Schedule C and Schedule SE. They often have limited education, live in remote areas far from tax preparation services, and many are Alaska Natives with cultural and language barriers to understanding taxes. They work in an unpredictable, dangerous industry far from any significant Federal presence. Permit holders often do not file required information returns on behalf of their crew members. As for the permit holders themselves, the State of Alaska has thus far refused to transfer limited entry permits on those occasions when IRS has instituted seizure and sale proceedings against the most serious delinquency cases. This effectively forecloses the possibility of one of the most credible enforcement options. To a large degree, the collectibility of much of the delinquent taxes hinges on the IRS' ability to exercise this option. However, this may soon become possible, as the matter is pending in U.S. District Court.

This combination of factors is a recipe for nonfiling of income tax returns. IRS has limited resources in Alaska to cover a land mass 2 1/2 times the size of Texas. It is common for a young newcomer not to file returns for all the reasons mentioned, then to wait apprehensively for the day IRS arrives on the scene. In the past, this has been a long wait.

Compliance 2000 Initiatives

The Anchorage District of IRS has long known, based on case experience, that a significant nonfiler problem exists in the commercial fishing industry. In late 1991, changes began to take place creating new opportunities for addressing the issue. Increased support from the U.S. Department of Justice resulted in expedited prosecutions of nonfilers throughout Alaska. Later, the IRS Nonfiler Initiative gained momentum. Also, National Office Compliance Research agreed to assist the Anchorage District in a major research project to support the effort.

Concurrently, IRS' new Compliance 2000 approach emerged. Its mix of outreach and enforcement was a perfect fit for a range of activities already underway. Commercial fishing quickly became the Anchorage District market segment for a Compliance 2000 prototype. The Compliance 2000 emphasis on establishing baselines for measuring compliance also meshed well with the research project under development.

Measuring the Problem

What was needed was a systematic means to measure the extent of the problem. Also desired was an automated mechanism to identify specific nonfilers and their income levels, thus allowing the district to apply its limited resources to priority cases. These needs were met by combining a variety of internal and external databases.

Two databases obtained from State of Alaska records provided the basis for identifying the commercial fishing population. One was a file of all permit holders and the other contained data on all commercial fishing licenses issued to crew members. Each file was available for both 1989 and 1990. This information was then matched with IRS Individual Masterfile (IMF) data to establish clear associations between names and Social Security Numbers (SSNs)—including those instances where the person on the Alaska files appeared as a "secondary" SSN on IRS records (i.e., the spouse on a married-filing-joint return). Through this matching process, we developed a master list of individuals that represented the entire commercial fishing industry.

We then extracted necessary tax return, address, and other useful data for both 1989 and 1990 from the IMF for all of the individuals on our master list. Any individual who filed a return for a given tax year would have a "module" of data on the IMF for that year; if no "module" could be found on the masterfile for that individual and year, we considered that person (or couple) a potential nonfiler. The list of potential nonfilers identified in this way was refined to include only those who had a limited entry permit or a commercial fishing license during the year in question. (Note that this list potentially includes some people who had no filing obligation.)

Having identified the two populations (permit holders and crew members) and the potential nonfilers in each for both 1989 and 1990, we then identified income data for these nonfilers from two sources. For permit holders, we had another state file—this one containing aggregate information from the "fish tickets" documenting the quantity and value of the catches delivered to the fish processors. In addition, for both permit holders and crew members, we extracted relevant income and withholding data from IRS' Information Returns Masterfile (IRMF), compiled by the Information Returns Program (IRP) of the IRS. We were able to construct baseline nonfiling rates without these income data, but knowledge of at least a portion of their incomes confirmed that large income amounts are often involved. The income data also helped identify specific high-income nonfilers to contact.

Results

As expected, the data show a substantial nonfiling problem in the commercial fishing industry. The size of the two fishing industry populations and the nonfiling subpopulations within them are given in Table 1, together with the resulting nonfiling rates. The rates indicate that nonfiling increased in both populations from 1989 to 1990. For example, among permit holders, our results indicate that nonfiling grew from 10.3 percent in 1989 to 13.1 percent in 1990. It is also clear that nonfiling is much more prevalent among crew members, which was 27.3 percent in 1990. This result is consistent with the fact that crew members tend to be more transient, and typically have less information about them reported to IRS compared to permit holders.

Table 1
Population and Nonfiling Statistics, Permit Holders and Crew Members

Type of Taxpayer	1989	1990
	(1)	(2)
Permit Holders		
Population[1]	13,708	14,601
Nonfilers[2]	1,412	1,910
Nonfiling Rate	10.3%	13.1%
Crew Members		
Population[1]	27,132	30,179
Nonfilers[2]	6,265	8,237
Nonfiling Rate	23.1%	27.3%

[1] Potential number of returns; if both spouses are in the group they are counted just once. Also, a small number of people are in both the permit holder and crew member groups, and are counted in each.
[2] May include some with no filing obligation.

Table 2 illustrates the average annual magnitude of the nonfiling in dollar terms. On average, an estimated 1,661 nonfiling permit holders received over $100 million in fish ticket receipts (over $62,000 per taxpayer) per year and almost $16 million in income reported on information returns (almost $10,000 per taxpayer) per year. Similarly, an average of 7,251 nonfiling crew members received over $70 million in income reported on information returns (almost $10,000 per taxpayer) per year—roughly 40 percent of which was fishing income. Although some tax was withheld on their IRP income, the average withholding rate was significantly lower for nonfilers than for filers. Experience in the Anchorage District suggests that significant additional amounts of tax were undoubtedly due from many of the nonfilers. Moreover, Table 2 indicates that permit holder nonfilers account for 11.7 percent of all permit holders, and yet received only 6.5 percent of fish ticket income, 2.3 percent of IRP income, and had only 1.4 percent of the tax withheld on IRP income. The pattern is similar for crew members. This suggests either that one contributing factor to the nonfiling is having less income subject to IRP and withholding, or that nonfilers simply tend to have less income—or both.

Table 2
Average Annual Income and Withholding Amounts, Permit Holders and Crew Members

Type of Taxpayer	Nonfilers	Filers	Nonfilers as a % of Total
	(1)	(2)	(3)
Permit Holders			
Number of Individuals	1,661	12,494	11.7%
Total Fish Ticket Receipts	$103,964,651	$1,464,609,960	6.5%
Average per taxpayer	$62,592	$116,831	
Total Income Reported on IRP Docs	$15,605,593	$677,939,097	2.3%
Average per taxpayer	$9,516	$54,263	
Total Fish Income on Form 1099-MISC	$5,422,737	$136,953,406	3.6%
Average per taxpayer	$3,265	$10,962	
Total Tax Withheld	$717,356	$49,657,162	1.4%
Average tax withheld	$432	$3,991	
Crew Members			
Number of Individuals	7,251	21,405	25.3%
Total Income Reported on IRP Docs	$71,673,146	$567,969,671	11.2%
Average per taxpayer	$9,665	$26,536	
Total Fish Income on Form 1099-MISC	$29,162,506	$150,005,972	16.3%
Average per taxpayer	$4,025	$7,006	
Total Tax Withheld	$4,266,311	$51,776,134	7.6%
Average tax withheld	$591	$2,419	

Note: The figures in the table are averaged over tax years 1989 and 1990. This adjusts for normal fluctuations in the dollar value of the catchee, which depend on prevailing market conditions.

The research project not only established nonfiler baselines for evaluating the impact of Anchorage District's Compliance 2000 efforts, but also identified thousands of recent individual nonfilers. After sorting the database in descending income order, the District systematically contacted hundreds of permit holder nonfilers. From June 1992 through April 1994, 1,535 delinquent returns were secured or substitutes for return processed for 677 permit holders for tax assessments in excess of $9.4 million (at an average of $6,125 per return). The District has emphasized permit holders to date since they largely control the industry.

As shown in Table 1, the nonfiler rate for crew members is even higher. Sorting the database in descending order of income revealed that over 500 nonfilers had income in excess of $50,000. This suggests that while there is probably a significant nonfiling population within the commercial fishing industry that will respond favorably to various forms of IRS assistance and education, there also seems to be a segment of willful nonfilers that will always require some form of enforcement. The District will pursue the largest of these cases through traditional enforcement efforts. However, the needs of crew members are also being met with a variety of non-enforcement outreach efforts as part of the District's Compliance 2000 strategy. Although not the focus

of this paper, these outreach efforts include education, tax preparation assistance, and increased IRS availability in rural Alaska. Still, for many who do file either timely-filed or delinquent returns, the result is often a large tax bill they cannot pay, since, as a group, they are often without significant assets or steady income from which to pay delinquent taxes. For this reason, the district Compliance 2000 project is evaluating a possible legislative remedy—requiring withholding on payments to crew members, helping them to prepay their tax obligations as they earn their income.

Summary

The project has confirmed a serious nonfiler problem in the Alaska commercial fishing industry—both as a percentage of the population, and in dollar terms. Through an innovative use of internal and external data, we have established nonfiling baselines, identified specific high-income nonfilers most in need of outreach efforts and traditional enforcement contact, and have established a methodology for tracking the impact of the District's Compliance 2000 activities over the next several years. The findings of this research will also help to evaluate a legislative change initiative currently under consideration in the District to require withholding for Form 1099 fishing income.

Creating Measures for Selecting Low Compliance Market Segments

by Dennis R. Cyr, Dennis L. Estep and L.D. Reece

IRS has shifted its approach to tax administration toward a philosophy known as Compliance 2000. Compliance 2000 seeks to improve voluntary compliance with the tax laws by identifying "market segments" with common compliance problems and prescribing appropriate corrective treatments. To do so efficiently often requires data-driven identification down to the IRS district level of those market segments which are least compliant. To aid in this process, IRS' Southwest Region created new measures of income reporting compliance at the district level and used them to identify the least compliant segments. This article details the development of these measures (including cautions concerning their possible misuse and techniques for avoiding such misuse) and provides examples of their practical use for market segments comprised of both individual and business taxpayers.

Introduction

For the past 5 years, the Internal Revenue Service has shifted its approach to tax administration toward a philosophy known as Compliance 2000.[1] The driving force for this change was the spiraling cost of continuing to administer the tax system on a one-on-one enforcement basis.

The philosophy of Compliance 2000 represents a different way of dealing with taxpayers. Underpinning the philosophy is recognition that there may be more cost-effective means to encourage compliance than through enforcement alone. Compliance 2000 seeks to improve voluntary compliance and reduce noncompliance by identifying compliance problems within market segments and prescribing appropriate treatments at that level. A market segment is defined as, "... a group of taxpayers with common characteristics and tax situations..."[2] Ideally, the market segment approach will allow the IRS to reduce burdens for those taxpayers who are in compliance, focus outreach and assistance to those attempting but failing to comply, and direct enforcement to those choosing not to comply.

IRS' Southwest Region tested the market segment approach to tax administration using 13 Compliance 2000 prototypes. The prototypes included improving the construction industry's compliance in filing Form 1099 and improving the gaming industry's compliance in reporting casino receipts and tip income. These prototypes highlighted the need for a data-driven technique for identifying market segments with low compliance. We found anecdotal information alone to be insufficient because it was often either wrong or misleading.

Thus, Southwest Region developed a top-down, data-driven process that aids in determining which market segments have relatively low compliance at the IRS district level. The process involved creating new measures of compliance at the district level which could then be used to identify the least compliant market segments. The original Compliance 2000 prototypes emphasized several compliance measures: accuracy of reporting, timeliness of filing, timeliness of paying, and percentage of nonfilers.[3] However, the measures we developed deal only with the income reporting accuracy for market segments at the IRS district level.

Methodology

Our methodology involved creating measures of reporting compliance—generically called compliance ratios—which could then be used to rank market segments in a district from least to most compliant. Those least compliant could then be identified and further studied for ways to improve their compliance.

We developed compliance ratios specifically targeted at the accuracy of reporting income. For individual taxpayers (i.e., non-business), we focused on salary and wage income. For business taxpayers, we focused on the ratio of gross profits to gross receipts expressed as a percentage.

We computed the compliance ratios following the descriptive observation/estimation ratios suggested by Plumley.[4] The basis for this method is that for each aspect of voluntary compliance there is an observed behavior we wish to encourage. For example, we observe the amount of income voluntarily reported on filed returns. However, to make

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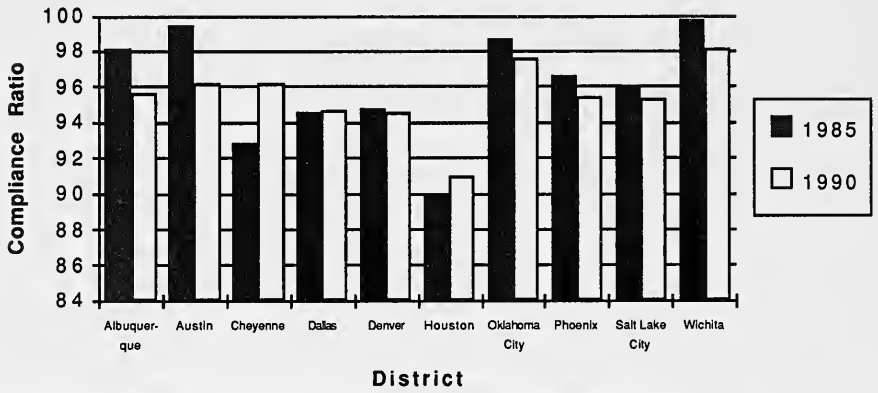
Figure 1
Compliance Ratios for Individual Taxpayers
Southwest Region Districts



Note: Data are for example purposes only and do not necessarily represent true compliance levels.

comparisons between market segments, such observations must be tempered by a corresponding amount that would be associated with perfect compliance. Thus, if the amount of income voluntarily reported on filed returns is divided by the amount of income that should have been reported, the result is a compliance ratio.

The ratios were estimated using a combination of IRS and non-IRS data. The numerator of each ratio used internal data (i.e., the income reported on the actual tax returns). The corresponding denominator of each ratio was a surrogate for true obligations.[5] Unfortunately, we cannot observe true obligations, we can only estimate them. Thus, a key aspect of the methodology is identifying a surrogate for true obligations that is readily available for the market segment.

In order to identify low compliance market segments for business taxpayers, we calculated our compliance ratios for a variety of market segments defined by taxpayer characteristics. The first characteristic was Principal Industry Activity (PIA) code, which described the type of business activity the taxpayers engaged in. The second was tax form type (e.g., Form 1120, Form 1065), which described the type of tax forms filed by the businesses. The third captured the size of the businesses in the segment. Size was measured by annual gross receipts and sales volume. Lastly, we calculated the compliance ratios by zip code.

Ratios for Individual Taxpayers

Using the above methodology, the numerator in our compliance ratios for individual returns was the amount of salary and wage income reported on the tax returns for a particular market segment (in our study we used IRS districts as market segments). The ideal denominator would be the amount of salary and wage income that should have been reported.

We do not currently have the ability to estimate this "true" denominator amount at the district level on a yearly basis with the same reliability as we can estimate it at the national level. We therefore sought a surrogate measure to use in the denominator that was readily available and highly correlated with the true amount that should have been reported. We also wanted this surrogate to be based on information other than observed tax return data (in contrast to the numerator), so that it would not reflect the compliance behavior of the group of taxpayers studied. In this case, we used wage and salary income estimated by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA).[6]

Figure 1 shows the compliance ratios for individual taxpayers in the Southwest Region by IRS districts for tax years (TY) 1985 and 1990.[7] It illustrates that the ratios permit measurement of progress over time and by district. However, we must note that the denominators in the ratios can vary for reasons other than variations in true reporting obligations. Thus, these measures must be interpreted carefully. Such unrelated variations are likely to be smaller on a year-to-year

basis than they are on a district-to-district basis. Therefore, analysis of these measures over time for a single district may be more meaningful than comparison of the actual levels of the measures among districts for any given year.[8]

Comparing the districts, the ratio for Houston District is lowest among Southwest Region districts, while the ratio for the Wichita District is highest. Although we might conclude that compliance is lowest in Houston for individual taxpayers, we need to more thoroughly investigate the degree to which factors not related to compliance cause the denominator to misstate true reporting obligations among districts (techniques for doing such analysis will be discussed in another section of this article).

Figure 1 indicates that such factors exist in that it suggests lower reporting compliance for wage and salary income than is commonly perceived. Our ratio for Southwest Region as a whole was 94.9 percent in TY 1990, while the national ratio has been consistently measured at over 99 percent. In part, this is due to conceptual differences between the numerator and denominator. For example, the BEA estimates of wage and salary income are by place of work and the summary tax return observation is by place of residence. Thus, the observed value would be expected to differ from the estimate at least by the amount of commuting. In addition, BEA estimates include income earned by people with no filing requirement, thereby reducing the ratio. Both of these reasons cause our ratio to vary for reasons not related to compliance.

Ratios for Business Taxpayers

In contrast to the compliance ratio for individual taxpayers, the compliance ratio for business taxpayers was a ratio of ratios. Selected financial ratios from tax return data, such as gross profit to gross receipts, were combined to form the numerator of the compliance ratio.[9] For example, reported gross profit to gross receipts measures were combined from U.S. Individual Income Tax Return, Schedule C, Form 1040; U.S. Corporation Income Tax Return, Form 1120; U.S. Income Tax Return for an S-Corporation, Form 1120S; and U.S. Partnership Return of Income, Form 1065. If a Form 1040 contained more than one Schedule C, each was included as a study record.

For the denominator in the business ratio, we borrowed a technique used by the lending community to generate standardized income statements. Specifically, we used industry standard financial ratios as a proxy for the gross profit percentage that should have been reported by a business. Customized market research data incorporating such factors as location, sales level, and type of business were secured for use as industry standard data.[10] These data are not necessarily statistically representative of the population at the low level of aggregation represented by an IRS district office. For example, where the data had only one business in an industry/location/sales level category, that gross profit percentage was used as the industry standard. Where more than one business existed in an industry/location/sales category, the unweighted average of the gross profit percentages was used as the industry standard. Thus, a single business could significantly affect the ratio for a given market segment. An alternative would have been to use the median gross profit percentage of several businesses in an industry without regard to location.[11]

Returns filed with nonexistent or missing PIA codes, along with businesses reporting gross receipts under $1,000, were excluded from this study. The gross receipts floor was established to eliminate 'sham' businesses and those either just beginning or ending operations.[12] Finally, PIA codes were converted to the more commonly used Standard Industrial Classification codes (SIC).

By using gross profit percentages, the ratios focus on underreporting of income. It should be noted that noncompliant taxpayers may understate both gross receipts and cost of goods sold (gross profits) to match the industry standard. Our ratios will not detect such noncompliance, and thus our measure is not a comprehensive compliance ratio. Also, for services and other businesses without inventory, net profit percentages may be more appropriate. We have experimented with both measures individually and together.[13] However, these two are the only current choices for Schedule C (i.e., sole proprietor) information, because Schedule C does not require balance sheet information.

In general, one can presume that a lower compliance ratio indicates lower income reporting accuracy. However, proper comparison also requires that small business financial results be separated from the results of larger businesses. Small businesses may have a low ratio because their profits typically fall below industry standards. Thus, businesses should be analyzed separately by size.

Also, a high ratio should not be interpreted strictly as indicating high compliance. A ratio of 100 indicates that reported gross profits equals the industry standard, and a ratio above 100 indicates that reported gross profits exceed the industry standard.[14] In general, we are interested in the rank of the ratios rather than the actual ratio value.

Selecting Market Segments Based on Descriptive Measures

Using businesses in IRS' Dallas District as an example, we demonstrate how a district might use our compliance ratios to identify a low compliance market segment. Table 1 presents the eight retail markets in the district ranked by their compliance ratios for TY 1990. Since the rank is in ascending order, the market segment with the lowest compliance is first in Table 1. As discussed above, our interest is in the rank order rather than the actual ratio value.

Table 1
Compliance Ratios for Eight Retail Markets By SIC Code for Dallas District

SIC Code	Market Segment	Number of Businesses	Sales Volume	Compliance Ratio
	(1)	(2)	(3)	(4)
55	Auto Dealers & Service Stations	9,868	$13,974,930,804	75.3
58	Eating & Drinking Places	9,097	$5,024,077,134	83.6
54	Food Stores	4,507	$4,243,058,809	105.9
59	Miscellaneous Retail	35,701	$12,406,359,653	109.2
52	Building Materials & Garden Equipment	1,980	$1,372,981,754	111.3
53	General Merchandise Stores	979	$18,147,244,791	123.9
56	Apparel & Accessory Stores	3,235	$982,924,326	126.1
57	Home Furniture & Furnishing Stores	4,614	$2,756,973,251	155.6
Total		69,981	$58,908,550,522	105.0

Note: Data are for example purposes only and do not necessarily represent true compliance levels.

As shown in Table 1, both the "Automotive Dealers and Service Stations" and the "Eating and Drinking Places" market segments reflect ratios below 100. In view of Taxpayer Compliance Measurement Program results at the national level,[15] we selected Eating and Drinking Places as the market segment most likely to need further attention.

Table 2 shows information about Eating and Drinking Places by tax return type. While corporate entities in this market segment report most of the sales, sole proprietorships account for just over two-thirds of the number of businesses. The ratio for Schedule C businesses is less than that for corporate businesses, which is consistent with other research findings.

Table 2
Compliance Ratios for Eating and Drinking Places By Tax Form Type for Dallas District

Tax Form Type	Number of Businesses	Sales Volume	Compliance Ratio
	(1)	(2)	(3)
1040	6,100	$709,853,424	80.3
1065	616	$705,307,318	85.1
1120S	983	$857,985,975	89.5
1120	1,398	$2,750,930,417	93.3
Total	9,097	$5,024,077,134	83.6

Note: Data are for example purposes only and do not necessarily represent true compliance levels.

Table 3 compares the ratios for Eating and Drinking Places by six sales levels. These ratios suggest that businesses with gross receipts under $1 million have the lowest compliance, while accounting for 93 percent of businesses comprising the market segment. Again, it is interesting to note that it is common across market segments for the lower compliance ratios to be associated with lower sales volume, although there are exceptions.

Table 3
Compliance Ratios for Eating and Drinking Places By Gross Receipts for Dallas District

Gross Receipts Category	Number of Businesses	Sales Volume	Compliance Ratio
	(1)	(2)	(3)
< $1 Million	8,452	$1,315,029,346	81.5
$10 < $25 Million	19	$282,109,244	100.4
$3 < $5 Millon	65	$253,240,459	108.9
$1 < $3 Millon	499	$811,262,891	109.9
$5 < $10 Millon	46	$304,684,983	133.4
> $25 Million	16	$2,057,750,211	134.1
Total	9,097	$5,024,077,134	83.6

Note: Data are for example purposes only and do not necessarily represent true compliance levels.

Table 4 shows the 10 Dallas District zip codes having the lowest ratios for Eating and Drinking Places with sales under $1 million and at least a dozen such businesses in each zip code. We note that each of the 10 zip codes shown in Table 4 are located in either northwest or north central Dallas

County. However, we also note that these results are for example purposes only and do not necessarily indicate a compliance problem in these zip codes.

Table 4
Compliance Ratios for Eating and Drinking Places By Zip Code for Dallas District

Zip Code	Number of Businesses	Sales Volume	Compliance Ratio
	(1)	(2)	(3)
75061	13	$780,741	13.0
75081	13	$502,624	19.2
75006	12	$715,294	26.8
75231	13	$3,917,242	32.5
75240	15	$2,523,704	34.3
75234	14	$1,378,933	37.0
75235	14	$2,985,691	38.1
75080	13	$766,021	40.3
75230	13	$4,024,203	41.7
75062	15	$2,944,741	46.5

Note: Data are for example purposes only and do not necessarily represent true compliance levels.

Together, Tables 1 through 4 illustrate the top-down, data-driven identification of market segments with low compliance using compliance ratios. However, it should be recognized that the above represents only a descriptive analysis, and does not account for some of the problems inherent in the measures we developed. In other words, we only described what we observed, and did not identify why the ratios varied from segment to segment. More research is necessary to account for these problems before a market segment can be selected.

Refining Market Segment Selection Based on Prescriptive Analysis

Is it reasonable that reported gross profit percentages exceeded industry standards in six of the eight retail markets in the Dallas District during 1990? A more reasonable explanation is that variation in the estimates of industry standards (i.e., the denominators) is influenced by factors unrelated to compliance. Such factors may include the age of the business, the mix of various lines of business within a larger category,[16] geographic variations within zip codes (e.g., new shopping malls vs. old downtown business districts) and the nature of the external data.

Our measure of compliance will be in error to the extent that factors unrelated to compliance contribute to variation in the denominators and those factors are not controlled for. Two types of errors are possible, either noncompliance will be suggested in market segments with compliant taxpayers, or compliance will be suggested where noncompliance exists.

Plumley[17] suggests prescriptive analysis as a means of controlling for the factors unrelated to compliance. Using the previous example of individual taxpayers, suppose that commuting (RESADJ) and no-tax liability workers (#NOFILEREQ) were all that prevent the BEA wage and salary estimates (BEAW&S) from representing true wage and salary income that should have been reported.[18] Then the separate impact of these factors can be determined using a technique such as regression analysis. The following equation for observed wage and salary reporting (IRSW&S) is suggested:

$$IRSW\&S = \beta_0 + \beta_1(RESADJ) + \beta_2(\#NOFILEREQ) + \beta_3(BEAW\&S) + e_i;$$

where the betas (ß) represent estimated regression coefficients and epsilon (e) the error term.

BEA makes residence adjustment (RESADJ) estimates along with their wage and salary estimates. The residence adjustment may be either positive or negative depending upon the reason for the adjustment (i.e., for in-commuting or out-commuting). Therefore, either sign may appear in the regression equation for this variable. A proxy for no-tax liability workers might be the number of persons below the poverty level in 1990.[19] The relationship of this proxy (#NOFILEREQ) to observed wage and salary reporting (IRSW&S) is expected to be negative. Thus, a geographic area with a high percentage of workers with no income tax filing requirement is expected to have a lower ratio than a similar area with a smaller percentage of workers having no filing requirement. Estimates for the value of #NOFILEREQ and its coefficient in both geographic areas are necessary to control for variation in reporting due to variation in workers with no requirement to file. A positive sign is expected for the (BEAW&S) coefficient, the proxy for the true wage and salary reporting requirement.

Once we have controlled for those factors causing variation in the compliance measures that are independent of compliance, we should still determine what caused that variation in compliance. If we can do so, then we might be able to prescribe a plan of action to improve compliance (and the corresponding compliance measure) in the future. That is perhaps the most important role of prescriptive analysis. It may be possible to do this by introducing relevant measures of IRS activities into the above equation to see what independent impact they have on the observed compliance behavior. This would be inferred from the corresponding regression coefficients.

An analogous approach is necessary for the business measures described above—controlling for the factors suggested earlier, such as age of business, mix of various lines of business, etc. However, it is necessary to accompany suggestions for use of sophisticated statistical techniques such as regression analysis, with cautions. Such cautions are particularly appropriate for research at the district office level. Specifically, we need to recognize that the low number of observations has important statistical implications (i.e., degrees of freedom) for model specification.

Conclusions

We have discussed how a top-down, data-driven process can aid a district in identifying which market segments have relatively low compliance ratios. Once compliance ratios have been created and the low compliance market segments identified using descriptive analysis, the real work begins. Before a district commits resources to a market segment, it should take further steps to investigate the various factors influencing their compliance ratios using prescriptive analysis. Other sources of data will typically be needed for this purpose. Regression analysis is suggested as a possible tool for prescriptive analysis. However, any sophisticated statistical analyses could be conducted by analysts familiar with how to use the techniques and interpret the results.

In conclusion, researchers undertaking similar projects should ask several questions of any compliance measures they develop:

- What aspect of voluntary compliance behavior is observed (e.g., reporting accuracy)?
- What readily available measure can serve as a proxy for true obligations (e.g., BEA estimates of wage and salary income)?
- Why might this proxy for true obligations differ from the actual value (e.g., commuting and employees with no filing requirement)?
- What other factors, unrelated to compliance, might contribute to variations in the descriptive measures (e.g., data limitations)?
- Can we control for the factors unrelated to compliance and for factors that actually influence compliance (e.g., IRS activities)?
- Can we quantify these factors and include them in the prescriptive analysis, enabling us to prescribe a plan of action to improve this aspect of compliance?
- What data limitations might influence the results and what impact might they have?

Endnotes

[1]Mulvany, Lynda L. and Ken R. Beier, "Compliance 2000—A New Direction for an Old Agency," **The IRS Research Bulletin,** 1992, pp. 50-52.

[2]"Compliance 2000 Orientation Guide," U.S. Department of the Treasury, Internal Revenue Service, Document 9102 (7-93) Catalog Number 15644C, p. 16.

[3]"Compliance 2000 Communique No. 2," Department of the Treasury, Internal Revenue Service, Document 9044 (1-93), Catalog No. 14959U, p. 3.

[4]Plumley, Alan, "Estimating Descriptive and Prescriptive Compliance Measures: The Alaska Commercial Fishing Industry Compliance 2000 Prototype," (Internal Paper), United States Department of the Treasury, Internal Revenue Service, March 1992, p. I.

[5]As will be discussed later, some of the variation in the ratios which we develop is likely due to reasons independent of voluntary compliance.

[6]BEA develops these estimates of local wage and salary income primarily from data collected by the Bureau of Labor Statistics, U.S. Department of Labor.

[7]Wage and salary disbursements account for almost 59 percent of total personal income in the Southwest Region.

[8]One interpretation of Figure I suggests that year-to-year variations may not be significant after all. Notice that the three districts with the lowest ratios all showed improvement in 1990, while the remaining higher ratio districts showed decline. This is consistent with the possibility that there is some randomness to the ratio, with a distribution over time around a district's mean ratio or trend. This phenomenon, called "regression to the mean," results in an unusually high (or low) value in one year being followed the next year by one closer to the overall mean. If this is true, then we should compare means rather than levels or changes.

[9]Data were taken from IRS' Individual Returns Transaction File and Business Returns Transaction File.

[10]The external data do not identify specific businesses or taxpayers.

[11]Limited tests using such data suggest similar rankings, but very different compliance ratio values.

[12]The resultant study population represents approximately 65 percent of all retail business returns filed in the Dallas District during calendar year 1991.

[13]Nonparametric rank order correlation tests for inventory businesses at the 2-digit SIC level between markets ranked by gross profit percentage and markets ranked by net profit percentage tend to be negatively correlated or insignificant.

[14]Nonoperating income, inaccurate PIA codes, small sample size and returns excluded from consideration may all lead to compliance ratios above 100.

[15]See Charles W. Christian, "Voluntary Compliance with the Individual Income Tax: Results From the 1988 TCMP Study" in this publication.

[16]For example, Miscellaneous Retail includes more than 20 4-digit SIC codes that range from drug stores to tobacco stores with florists and jewelry stores between.

[17]Plumley, p. 3.

[18]Note that the nature of the denominator is such that nonfiling is another potential cause of variation in the measure. If not controlled for separately, we must attribute the "compliance" variations to some combination of reporting compliance and filing compliance.

[19]In 1990, the average income cutoffs for a family of four was $13,359. See **Statistical Abstract of the United States,** U.S. Department of Commerce, Bureau of the Census, 1993, p. 469.

VCI: A Prototype for District-Level Data-Driven Compliance Research

by Ronald J. Bartyczak

This article discusses the development, implementation and uses of the Voluntary Compliance Index (VCI) system. The VCI system is a menu-based microcomputer data analysis system which IRS district office analysts can easily use. The purpose of the VCI system is to provide a means to develop data-driven tax-related market segments for each district office based on a variety of compliance measurements. The VCI system also allows for profiling (financially and demographically, based on tax return and other IRS internal information) of any group of taxpayers defined as a market segment.

Background

In August 1992, the Voluntary Compliance Index (VCI) Group was established within the then, National Office Research Division. The mission of the VCI Group was to develop a computer-based data analysis system to test the concept of estimating the compliance characteristics of market segments defined using a district's population. This initiative was the successor to the "Hartford Project" in which the Research Division developed a method to estimate and display the tax compliance levels for the Hartford District by specific market segments (including generation of geographic maps by zip code).

Test Districts

With the help of the Regional Commissioners and Regional Compliance 2000 Coordinators, the Research Division identified eight VCI test districts. They were Chicago, Cincinnati, Ft. Lauderdale, Hartford, Manhattan, Oklahoma City, Philadelphia and San Francisco. The VCI Group delivered the initial VCI systems to the San Francisco and Hartford Districts in May 1993 with subsequent deliveries occurring at the rate of about one per month. We delivered the last VCI system to the Manhattan District in December 1993.

The VCI system deliveries included the hardware, software and district-specific database along with an intensive, hands-on training session. The training emphasized the top-down data-driven approach to identifying a market segment for a district. Also, the training demonstrated the absolute necessity of becoming thoroughly familiar with the data and its definitions in order to properly interpret the output from the system.

In order to get the prototype of the VCI system in the hands of the test districts as quickly and as cost effectively as possible, we choose to use a microcomputer with a "fast" processor and a very large hard drive as the computing platform (in lieu of a much more costly minicomputer). Also, we used commercial "off-the-shelf" software to design and program the user interface.

Data for the VCI System

As originally conceived, the VCI system would include a variety of data files unique for each district. We planned to include internal IRS data sources for individual and business taxpayers (i.e., tax return filers and nonfilers), the most current Census Bureau information (aggregated at the ZIP code level) and external data that was either commercially available or available from state and local governments.[1] However, because we imposed very tight delivery dates for the VCI system, we were only able to extract data and develop an interface to use with the internal IRS data for individual (Forms 1040) taxpayers.

We extracted and constructed about 400 data elements for each district's VCI system. Examples of each of the data elements are shown below.

Taxpayer Specific Information—Examples[2]

- Current Zip Code for taxpayer(s)
- Date of Birth (of primary filer)
- (Most Recent) District Office Location Code
- Tax Year of Latest Posted Return

Taxpayer's Tax Year Account Data—Examples[3]

- DIF Score (for Examination)
- COPYS Score (for Collection)
- Historical District Office Location Code
- Total Positive Income
- Current (Account) Status Code
- Current (Account) Status Date
- Estimated Tax Penalty
- Estimated Tax Penalty Date
- Return Received Date

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Tax Return Information—Examples[4]

- Zip Code from the Return
- Filing Status
- Wages
- Adjusted Gross Income
- Total Contributions (Schedule A)
- Excludable Savings Bond Interest (Schedule B)
- Gross Receipts on (first) Schedule C
- Royalties Received (Schedule E)

VCI Generated Data—Examples

- Age of Primary Taxpayer
- Principal Industrial Activity Category Codes
- Post of Duty
- Balance Due after Remittance
- Predicted Tax Change
- Total Tax on returns which were filed between 4/16 and 8/15 that had a valid extension and were full paid

Sample and Aggregate Data Files

Since the population of an entire district would not fit on a microcomputer and be accessible by the interface that we programmed for the VCI system, we used a combination of aggregate data and sample data files. The aggregate data files contain population information summarized in predefined groups based on combinations of exam class, post-of-duty, zip code, principle industrial activity (PIA) code and principle industrial activity category. We included the aggregate data files to provide complete counts and values for each district's population. These aggregate data files helped to provide a comfort level for the district (i.e., to compare actual counts with estimates from the sample data files) and could be used to begin a district's top-down compliance analysis. We intended the sample data files to be the basis of most of the district's data-driven compliance research.

The sample data files consisted of between 65,000 and 90,000 data records (i.e., tax records for filers and nonfilers[5]) for each tax year. The sample design emphasized Schedule C and Schedule F filers by selecting at least one filer in ten, but not more than one filer in two. This design allowed each district to focus on specific types of businesses (i.e., PIA codes or categories).

An important aspect of both the aggregate data files and the sample data file is that we removed specific taxpayer identifiers such as names, SSNs and street addresses and we reduced the zip code to five-digits. We did this to minimize security and privacy concerns and to ensure that the VCI system was used to conduct compliance research rather than to select or prioritize enforcement functions' workloads.

Compliance Measures in the VCI System

One of the most critical aspects of conducting compliance research, and therefore an indispensable component in the VCI system, is the compliance measures. We developed several "standard" measures to allow the VCI system to address three compliance areas: reporting accuracy, payment completeness and timeliness of filing, and nonfiling of returns.

When we developed measures for these areas of compliance, we tried to make sure that the measures were independent. That is, the payment measurements did not consider whether the tax reported information on the return was accurate. Tax accuracy was measured with the accuracy measurement. Also, we tried to avoid the use of components which are directly affected by budget constraints.

For each of the three areas of compliance, we developed separate measures to show the tax dollar impact and the number of individuals (i.e., returns filed). This resulted in development of a total of eleven measures; two for reporting accuracy, six for payment completeness and three for nonfiling of returns. These standard measures are listed below:

Reporting Accuracy

- Percent of Returns with Little or No Predicted Tax Change
- Percent of Estimated Tax Due that is Reported[6]

Payment Completeness and Timeliness of Filing

- Number of Full-Paid Returns that were Timely Filed by 4/15 as a Percent of all Returns Filed by 4/15
- Tax Reported on Full-Paid Returns that were Timely Filed by 4/15 as a Percent of Tax Reported on all Returns
- Number of Full-Paid Returns that were Timely Filed by 8/15 as a Percent of all Returns Filed by 8/15
- Tax Reported on Full-Paid Returns that were Timely Filed by 8/15 as a Percent of Tax Reported on all Returns

- Number of Full-Paid Returns Timely Filed by 12/31 as a Percent of all Returns Filed by 12/31

- Tax Reported on Full-Paid Returns Timely Filed by 12/31 as Percent of Tax Reported on all Returns

Nonfiling of Returns

- Estimated Rate of Nonfiling of Returns

- Estimated Rate of Definite Nonfilers to All Nonfilers

- Estimated Rate of Definite Nonfilers

Also, we designed the VCI system to allow analysts to define their own compliance measures. For example, using one of the standard payment measures as a start, an analyst could define a new compliance measure as:

- Tax Reported on Returns that were Timely Filed by 4/15 as Percent of Tax Reported on all Returns Filed

Since this measure would not require the returns to have been "full paid" when they were filed (as does the standard payment compliance measure), it will provide a somewhat different compliance aspect of the population.

In addition to variations on the standard compliance measures, analysts can use the VCI system to define special interest measures using combinations of the almost 400 data elements. Examples of a special interest measure could be something as simple as "Average Adjusted Gross Income" or "Effective Tax Rate" to something as complex as the "Total of Gross Receipts (on all business schedules) divided by Total Positive Income."

This flexibility allows an analyst, using the VCI system, to quickly learn a great deal about a variety of characteristics of their district's population. However, this flexibility also requires substantive thought by the analyst to ensure that the results are meaningful (and can be properly interpreted). To aid in the proper use of the VCI system, we strongly recommended during the training session that at least two analysts use the system together. This allows for relevance and sanity testing of newly defined measures and market segments. We also suggested defining a compliance objective and preparing a research plan prior to beginning a VCI session to minimize the very real possibility of "getting lost in the data."

Top-Down Data-Driven Compliance Research Using the VCI System

The top-down data-driven approach to market segmentation and compliance research is the *raison d'etre* for the VCI system. The first part of the analysis using the VCI system requires that the analyst first select a compliance measure and compute a district-wide measure. This tells the analyst the district's overall compliance rate (or other characteristic if a user-defined measure was selected). This allows the analyst to obtain the proper perspective to compare the compliance rates or characteristics of specific market segments within the district.

After doing an initial district-wide analysis, the VCI system allows the analyst to continue to develop market segments by sequentially redefining the make up of the market segment. By continuing to use this sequential redefinition procedure, the analyst will be able to identify a market segment with a low (or high) compliance rate. (Note: A market segment obtained in this manner is not likely to have the lowest, or highest, compliance rate for the whole district's population. It will only be the lowest, or highest, compliance rate for the particular portion of the population being analyzed).

The VCI system allows the analyst to develop an almost infinite number of market segments. The VCI system does this by letting the analyst put parameters on any of the 400 data elements and combining them to define a subpopulation of interest. For example, a market segment could be defined as tax filers who had:

1) a filing status of head of household and

2) an adjusted gross income greater than $50,000 and

3) filed at least one Schedule C and

4) total gross (business) profit greater than $25,000

Once a market segment of interest has been identified, the VCI system allows the analyst to begin to profile the market segment. The analyst can do this by using the aggregation (or "group by") facility in the system. This lets the analyst see what effect other data elements in the market segment have on the market segment's compliance measurement. Also, if the analyst can identify a "companion" market segment[7], comparisons between their profiles may suggest causes of noncompliance and help to establish the types of treatment[8] might be productive.

District Use of VCI

We have received input from most of the test districts about how they have benefited from the use of the VCI system. Typically, the first use the districts made of the VCI system was to profile their population. For example, they determined:

1) the total number of filers by zip code and post of duty

2) the types of forms that were used by the filers

3) the type of business activity in which their filers were involved and

4) the baseline compliance levels for each of the standard measures for the above defined market segments

Additionally, many of the test districts have used the VCI system to provide information to a variety of functions within their district. Examples of this include providing information about electronic filers to Taxpayer Service, providing information about groups of taxpayers who had a balance due after remittance by zip code to Collection, and providing information about the market segment of "definite" nonfilers (i.e., taxpayers who filed after the processing year) in the construction industry to Examination. Many of the districts are using the VCI system to compare the compliance rates of groups of taxpayers that are involved in Compliance 2000 studies or other treatment programs with the compliance rates of other market segments.

Where Does VCI Go From Here?

The VCI system has convincingly demonstrated its ability to use IRS data to identify market segments with similar demographic and compliance characteristics. Its success was one of the major stimuli for the development of the Compliance Research Information System (CRIS) and the establishment of the District Office Research and Analysis (DORA) groups in selected district offices. To help in the development of CRIS, the VCI Group has been integrated into the newly organized National Office Research and Analysis (NORA) Operations Branch, in Compliance Research as the CRIS Support Group. Therefore, while the hardware, operating system and user interface of CRIS will undoubtedly be different from the VCI system, we expect that most (if not all) of the VCI system's features and functionality will be carried over or enhanced.

Endnotes

[1]For initial development, we expected to include information from the following files: the Individual Masterfile (IMF) and Individual Return Transaction File (IRTF), Forms 1040 tax return filers and nonfilers for tax years 1989, 1990 and 1991; the Business Masterfile (BMF) and Business Return Transaction File (BRTF) for tax years 1989, 1990 and 1991; and the 1990 U.S. Census data.

[2]Extracted from Individual Masterfile Entity section.

[3]Extracted from Individual Masterfile Module section.

[4]Extracted from Individual Return Transaction file section.

[5]The VCI system defined nonfilers as taxpayers for whom the IRS expected a tax return but had not received one during the calendar year that it was due.

[6]See Ho and Sattler, "Developing Measures of Reporting Compliance for Individual Tax Returns," **The IRS Research Bulletin,** 1992, pp. 53-57.

[7]A"companion" market segment is one that is similar to the market segment of interest but typically with a much higher or lower compliance rate.

[8]See Mulvany and Beier, "Compliance 2000—A New Direction for an Old Agency," **The IRS Research Bulletin,** 1992, pp. 50-52

Beyond Single Returns: The Related Returns Database

by Karen Slater

Measures of the results of an IRS examination have traditionally been based on the tax return as the unit of analysis. However, contacts with taxpayers by IRS are often on a case or account basis (i.e., involve multiple tax returns from multiple tax years). Therefore, developing measures based on case results adds another dimension to examination results. Such measures also may be useful in the study of taxpayer behavior and the effectiveness of IRS compliance efforts. This article details an innovative IRS database—the Related Returns Database (RRDB)—that contains such measures on a case basis. Preliminary analysis of small corporations in the RRDB in the Richmond District reveals that more than half of the tax returns examined are "secondary" returns (i.e., not those originally identified for examination). The RRDB also indicates that payment was due for 62 percent of the small corporation examination cases, 18 percent of these received full payment and another 4 percent they obtained in stallment agreements.

Introduction

At the completion of an IRS examination of a taxpayer's return, various statistics are collected and input into IRS databases for use in measuring examination accomplishments. Examples of the statistics collected on each return examined include: the assessments and abatements of tax made as a result of the examination; the number of hours used to complete the examination; and the dates the examination began and ended. From these statistics, productivity measures of dollars per hour, dollars per return and cycle time are computed. The statistics and measures are summarized in various ways and are used to monitor the Examination function's programs and activities.

The statistics currently collected are based on the taxpayer's primary return (i.e., the return initially selected for examination). However, contact with taxpayers is on a case or account basis (i.e., involves multiple returns). Richmond District realized that statistics based on the taxpayer's case would be useful. Such comprehensive statistics may provide insight into taxpayer behavior and possible measures of the effect of IRS compliance efforts.

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Thus, the District in conjunction with the Mid-Atlantic Region set out to develop a new database for these case statistics called the Related Returns Database (RRDB).

Single Return Examination Statistics

A potential examination of a taxpayer usually begins with one of the many tax return types (e.g., Form 1120, Form 1040, Form 941, etc.) a taxpayer might file with the IRS in any given year. The tax return initially selected for examination is considered to have the highest probability for change in taxes owed after completing the classification process. Classification is an internal review of the tax return for large, unusual or questionable items. The review is conducted at any of a number of levels ranging from the service center where it is filed to the examiner to whom it is assigned. During the review, the tax return may be accepted as filed or classified for examination. Once a return is classified, the examiner contacts the taxpayer and the examination begins.

As part of the examination, an analysis of other returns filed by the same taxpayer or related taxpayers is conducted by the examiner. As a result of the analysis, the examination may be expanded to include the taxpayer's other tax returns. When the examination is completed, the examiner closes the return(s) as a "case." In most instances, a case is composed of the initial "primary" return examined and any related or "secondary" returns.

On closing, the results of the examination for each tax return are captured on Form 5344, Examination Closing Record, and input into the Audit Information Management System (AIMS).[1] The taxpayer account is identified by the taxpayer's name, taxpayer identification number (TIN), the tax period and the type of return. The information about the examination includes changes in tax liability, penalties and interest.

In addition to the results of the examination, other information is collected for use by management and input into AIMS. Examples of this type of information include the type of closing (e.g., no tax change, unagreed tax change), the hours used to complete the examination, the examiner's name and group number, and internal IRS project and program codes. From the data collected, statistics such as dollars per hour (the change in tax liability divided by the hours used to examine the tax return), dollars per return (the change in tax liability), and cycle time (the number of days from the beginning to the end of the examination) are computed. The

statistics are used to plan for future programs and to analyze the effectiveness of current compliance efforts and use of resources.

AIMS is the original source for most of the data for the Examination function's Closed Case Database (CCDB). CCDB is a download of AIMS records from the Detroit Computing Center into an off-the-shelf database software application. CCDB contains 12 months of examination results and management information. While the database is updated monthly, the status of closed returns is not always permanent (i.e., returns may be reopened for further examination). Therefore, the entire database is rebuilt each month, overwriting the previous data. Each IRS organizational level (national, regional and district) is provided with a CCDB containing their examination results information.

Developing the Related Returns Database

Primary return statistics are useful, however they do not allow for analysis of the total examination work product (i.e., the case). Taking return statistics and combining them into case statistics gives a broader view of examination productivity and the compliance of taxpayers. It becomes possible to see the number of returns and number of taxpayers included in the examination. Also, the results of the examination include multiple year's tax returns rather than just the current year being examined.

The possibility of developing a database for case statistics arose when Form 5344 was revised in September 1991 to include information about related returns and to provide a means for identifying the primary and secondary returns in a case. With the change in the form, this information was also input into AIMS at the close of the examination and subsequently fed into the CCDB.[2]

Using an off-the-shelf database software application compatible with CCDB, Richmond District and the Mid-Atlantic Region created the Related Returns Database (RRDB). To create the case records in the RRDB, the records in the CCDB were sorted to group them into "cases." This was accomplished by using the primary tax return TIN and matching it to the related TIN (these numbers are identified by the examiner on Form 5344). Identification of the primary tax return is important because it was initially identified as having the highest probability for change in taxes owed.

Each RRDB case record supplies primary return data, secondary return data, and total case data. The information collected about the primary return is similar to the traditional examination statistics, but without the confounding effects of the secondary returns. Secondary return information includes the Principal Industry Activity (PIA) code, the project code, the type of return and the source of the return. The secondary return data is in a list format and excludes information already presented in the primary return data. For example, it lists all PIA codes from the secondary returns excluding the PIA code found on the primary return.

The total case data can be divided into five categories:

- Results: The changes in tax liability are totaled for the primary and all secondary returns.
- Time: The hours used to examine the case are totaled.
- Case Attributes: Such as the oldest and most recent tax periods, indicators for whether an installment agreement or payment was received, and the most recent zip code.
- Counts: This information includes counts of the entities (i.e., taxpayers) and the number of tax returns in the case.
- Dates: Key dates are collected for each case. Dates for the earliest actions include the tax return posting date, the date established on AIMS, and the date the examination activity started. Dates for the latest actions include the date of closure and the last date of posting to the taxpayer's account.

The Appendix shows a complete list of the information collected for each case.

Interpreting Case Statistics From the RRDB

Using small corporate returns examined in Richmond District, we demonstrate the interpretation of case statistics (i.e., the information found on the RRDB) and how they differ from return statistics (i.e., the information found on the CCDB).[3] The data for the examples are from the CCDB for the 12 month period ending December 1993. Changes in tax liability are totaled for the cases and include any abatements or refunds of tax.

Assume a scenario where a corporate return with an activity code of 213 (assets of 250,000 to under $1 million dollars) is selected for examination, the results of this examination would traditionally be analyzed as shown in Table 1. Now assume that after initial analysis of the taxpayer's return and records, the examiner expands the examination to a subsequent year (now activity code 215 because the taxpayer's assets have grown to 1 to under 5 million dollars) and to the single shareholder's Form 1040 returns for those 2 years. On closing, the completed case has four tax returns. The activity code 213 return is identified as the primary return and the other returns as secondary.

Table 1
Small Corporate RETURNS by Activity Code

Activity Code	Asset Class ($1,000)	Returns	Hours/Return	Dollars per Return	Dollars per Hour	Cycle Days
	(1)	(2)	(3)	(4)	(5)	(6)
203	No Balance Sheet	160	35.2	$10,181	$289	262
209	Less than 250	387	29.3	$4,948	$169	251
213	250 Under 1,000	202	36.5	$12,615	$346	321
215	1,000 Under 5,000	247	39.4	$30,517	$775	259
217	5,000 Under 10,000	100	62.4	$247,142	$3,963	403

Note: Activity codes are based on asset class.

Under the single return approach, the two corporate returns would be included in Table 1. However, they would each be included as separate returns on their respective lines for activity codes 213 and 215 tax returns. The Form 1040 tax returns would be included with other individual tax returns in a separate analysis and not reflected in Table 1.

Under the RRDB approach, the case statistics would not be treated as four returns represented on separate lines. Instead they would treated as in Table 2, with the case identified under activity code 213 based on the primary tax return.[4] The results of the primary tax return combined with the activity code 215 tax return and the Form 1040 tax returns are shown on the same line.

The columns under "Case Information" in Table 2 show the average number of tax returns per case and the average number of entities per case. The hours column shows the average number of hours used for the examination, per case and per return. The dollars columns are based on the changes in tax liability for the entire case (i.e., the net of all tax years examined and expressed as averages per case, per return and per hour). Cycle days are computed from the earliest date of examination activity to the latest date a return is closed to the Appeals office or out of the AIMS system.

Comparing Tables 1 and 2, there were 202 activity code 213 tax returns examined during the period studied as shown in Table 1. Of these, 107 tax returns were the primary return in a case as shown in Table 2. This indicates that more than half of the corporate returns examined in activity code 213 are not those originally identified for examination (i.e., as having a high likelihood of tax change).

Further analysis provides a more complete picture of the actual workload imposed by a case. The activity code 213 cases had an average of 2.6 returns examined and involved an average of 1.4 entities. The closed cases had an average of $350 dollars per hour. This is slightly more than the dollars per hour of $346 for the activity code 213 tax returns in Table 1. The average cycle days for cases are also higher: 321 days for returns, 334 days for the cases.

Table 2
Small Corporate CASES by Activity Code

		Primary Return Information			Case Information							
		Hours/	Dollars per		Avg # of	Avg # of	Hours per		Dollars per			Cycle
Activity Code	Cases	Return	Return	Hour	Returns	Entities	Case	Return	Case	Return	Hour	Days
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
203	93	39.3	$11,199	$285	2.8	1.5	76.6	27.8	$21,648	$7,864	$283	302
209	193	37.4	$5,250	$141	3.2	1.6	69.5	22.1	$20,460	$6,495	$294	306
213	107	44.3	$8,403	$190	2.6	1.4	76.8	30.1	$26,875	$10,533	$350	334
215	124	51.9	$27,322	$526	2.5	1.3	77.6	31.0	$58,361	$23,269	$752	313
217	54	85.2	$108,793	$1,277	3.1	1.3	155.7	51.0	$548,603	$179,543	$3,524	407

Note: Activity codes are based on asset class.

Table 3
Small Corporate CASES by Type of Related Returns

Related Return Types	Cases	Primary Return Information: Hours/ Return	Primary Return Information: Dollars per Return	Primary Return Information: Dollars per Hour	Avg # of Returns	Avg # of Entities	Hours per Case	Hours per Return	Dollars per Case	Dollars per Return	Dollars per Hour	Cycle Days
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
No Related Returns	376	45.5	$20,488	$450	1.70	1.00	65.10	39.40	$37,854	$22,920	$581	288
1040 Only	152	49.3	$13,431	$272	4.40	2.40	119.20	27.00	$66,117	$14,955	$555	398
1040(s) and Others	19	42.1	$13,388	$318	8.70	2.80	109.60	12.60	$35,791	$4,121	$326	412
Other Types	24	51.5	$92,387	$1,794	6.50	1.10	87.30	13.50	$863,999	$133,780	$9,898	298

The secondary return fields provide an additional area for analysis of the types of related tax returns examined. Continuing the small corporation example, the two related Form 1040 returns in this case would be reflected on the line "1040 Only" as shown in Table 3.

As indicated in Table 3, examinations of small corporations during the period studied were expanded to other returns in 34 percent (195) of the cases. Nearly 78 percent of the time (152 out of 195 cases) the examinations were expanded to related Form 1040 returns only. Another 10 percent of the time (19 of the cases) the expanded examinations included "1040s and other" returns, and in 12 percent (24) of the cases the expanded examinations included only "other types" of returns. Other types of returns include Employment, Excise, Partnership, S-Corporation, Estate and Gift.

Use of RRDB in Compliance Studies

Case information appears to be well suited to measuring compliance and the effectiveness of compliance efforts. For example, Compliance 2000 studies of selected market segments (such as those based on PIA code or return type) could use the RRDB to analyze the compliance of that group. The RRDB could also enhance the profile of the market segment by providing an understanding of what types of returns other than the primary return may be affected by compliance programs directed at the market segment. As the PIA Code of the primary return is available, the RRDB could be of use to the Market Segmentation Specialization Program (MSSP) in understanding the industries they are focusing their efforts on. Table 4 shows information for the small corporation example cases by industry based on the PIA Code.

Another example of the use of case statistics is in the accounts receivable dollar inventory (ARDI) area. In addition to being able to measure dollar changes, information on installment agreements obtained and payments secured at the close of the examination is included in the RRDB. Thus, examination efforts to collect the deficiencies can be assessed. Using the small corporate cases example, the RRDB showed that payment was due on 356 or 62 percent of the examined cases. Of these, full payment was received in 18 percent of the cases and an installment agreement was obtained in 4 percent of the cases.

Conclusion

The Related Returns Database demonstrates that case statistics can add depth to examination results. It also indicates that case information may be well suited to studying taxpayer compliance and the effectiveness of IRS compliance programs. Richmond District continues to explore other practical uses of RRDB case statistics in studying IRS compliance efforts.

Table 4
Small Corporate CASES by Industry

Industry	Cases	Primary Return Information: Hours/ Return	Primary Return Information: Dollars per Return	Primary Return Information: Dollars per Hour	Avg # of Returns	Avg # of Entities	Hours per Case	Hours per Return	Dollars per Case	Dollars per Return	Dollars per Hour	Cycle Days
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Agriculture	3	26.3	$769	$29	2.0	1.3	58.0	29.0	$1,537	$769	$27	171
Construction	33	32.8	$967	$29	1.8	1.2	38.9	21.8	$14,781	$8,267	$380	153
Finance	16	34.7	$97,491	$2,811	2.4	1.4	46.8	19.2	$132,814	$54,488	$2,841	209
Manufacturing	14	53.5	$41,842	$782	2.6	1.4	70.9	27.6	$49,692	$19,325	$701	204
Mining	1	14.0	$100,285	$7,163	1.0	1.0	14.0	14.0	$100,285	$100,285	$7,163	135
Retail Trade	32	30.2	$8,111	$269	2.8	1.5	61.3	21.6	$25,115	$8,832	$409	204
Services	74	26.1	$5,671	$217	2.4	1.4	42.2	17.8	$10,902	$4,610	$258	171
Transportation	12	25.4	$8,081	$318	3.4	1.5	71.5	20.9	$27,135	$7,942	$380	214
Wholesale Trade	21	38.9	$2,859	$74	2.0	1.4	49.9	24.9	$4,586	$2,293	$92	188

Appendix

The following describes the information available on the Related Returns Database.

Primary Return Data

Activity Code*
Calculated Disallowance*
Claim Amount*
Claim Time*
DIF Score
District Office
Examiner's Grade
Industry of Case (based on Grade of Case) Non Organization Code
Principal Industry Activity*
Project Code*
Protection of Revenue Base Amount*
Source Code
Results of Primary*
Table 37 Amount*
Taxpayer ID Number
Taxpayer's Name
Tax Period Ended
Technical Level (based on Grade of Case)
Technique Code

*These items have related fields that provide information about the other returns in the case or about the case in total.

Secondary Return Data

Principal Industry Activity Codes
Project Codes
Return Types
Source Codes

Total Case Data

Results:
Calculated Disallowance
Claim Amount
Protection of Revenue Base Amount
Results of Taxable Returns
Results of Non-Taxable Returns
Results International
Table 37 Amount

Time:
Claim Time
International Time
Non-Claim Time

Case Attributes:
Aging Reason
Condition of Case
Delinquent Taxpayer
Earliest Tax Period Ended
Fraud Indicator
Installment Indicator
Large Case Indicator
Latest Tax Period Ended
Partial Agreement
Payment Received
Post of Duty
ZIP Code

Counts:
Delinquent Returns
Disposal Codes 01 - 13
Entities in Case
Returns in Case

Dates:
Earliest 150 Transaction Code Date
Earliest Date Established on AIMS
Earliest Examination Start Date
Latest Date of Disposal
Latest Examination Cycle Date
Latest Posting Cycle

Endnotes

[1]Tax returns under examination are controlled on AIMS. AIMS is part of the Integrated Data Retrieval System (IDRS) which interacts with IRS' master file. The system maintains taxpayer accounts, indicates whether a tax return is under examination and, on completion of the examination, posts any changes in tax liability to the taxpayer's account.

[2]Since the related return information is used to form the RRDB records, the quality of the related return information on Form 5344 is very important. Although related return information has been collected since September 1991, at first the information was not mandatory and therefore it was not always present. Recently, entry of the information became mandatory and the accuracy of the information has steadily improved from 54 percent of the records complete in the RRDB to 70 percent of the records complete.

[3]Small corporate returns are defined as entities filing either Forms 1120 or 1120A, with no balance sheet or with assets less than $10 million.

[4]By definition, the returns in Table 1 were used in the formation of the cases in Table 2.

TeleFile: Taxpayers Dial to File

by Michele R. Wise

On April 15, 1993, TeleFile closed the second filing season of a 2-year test that allowed eligible Form 1040EZ filers in Ohio to file their federal income tax returns by telephone. Unique to this test was the first filing of completely paperless returns using voice signature technology. Results indicate that TeleFile reduces taxpayers' preparation time and costs and increases use of the IRS' Electronic Filing System. Also, TeleFile showed no signs of fraud during the 2-year test, addressing a significant challenge to IRS' electronic filing program.

Introduction

National Office Research Division introduced TeleFile for filing season 1992 to support the IRS' efforts to reduce taxpayer burden and increase electronic filing volumes. At the time, TeleFile represented a new filing concept as it allowed taxpayers to file simple federal tax returns using their touch-tone telephones. It also allowed IRS to process these returns through its Electronic Filing System (EFS), a faster method which produces fewer errors than traditional paper returns.

The following text describes the results of the 1992 and 1993 filing seasons. Emphasis will be on the taxpayer burden reduction and increased electronic filing volumes generated by TeleFile.

1992 TeleFile Test

For the initial filing season, IRS mailed 1.2 million TeleFile tax packages to Ohio taxpayers who filed or were eligible to file a Form 1040EZ in 1991. Of these, IRS received a total of 125,969 TeleFile returns.

The taxpayers who used TeleFile overwhelmingly liked the new system and said they would use it again. In a follow-up survey of TeleFile users, 90 percent surveyed reported that TeleFile was easier to use than a Form 1040EZ.[1] In addition, 98 percent of users surveyed said they would "probably" or "definitely" use TeleFile again.[2]

IRS also conducted focus groups with TeleFile users and eligible nonusers. Individuals who used TeleFile said they liked the simple instructions, convenience and faster refunds that TeleFile provided them. TeleFile nonusers said they were comfortable with the current Form 1040EZ, did not have time to read the TeleFile instructions or had someone else prepare their returns.

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1993 TeleFile Test

The TeleFile test continued for a second year during the 1993 filing season. Taxpayers in Ohio (IRS' Cleveland and Cincinnati Districts) remained the test population. Cleveland District encompasses the northern part of Ohio, and Cincinnati District covers taxpayers in the southern part. However, while Cleveland District taxpayers used virtually the same system as during the 1992 filing season, Cincinnati District taxpayers tested new features, including voice signature. Voice signature is a technology that allows taxpayers to voice sign their returns instead of sending in written signatures.[3]

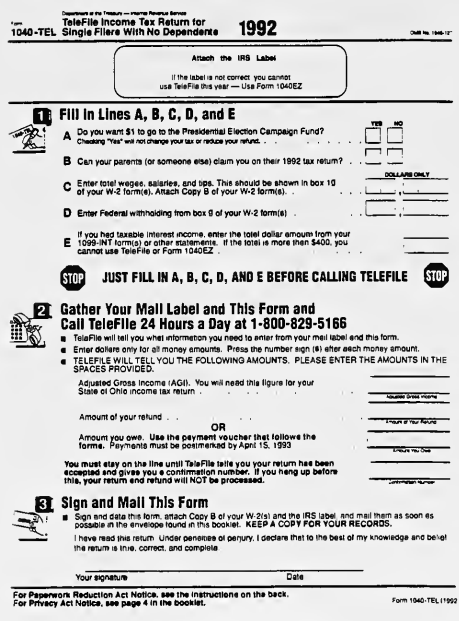
Voice signature was a precedent setting event for the IRS. Never before had IRS accepted an alternative (non-written) signature as the legal jurat for a tax return. To voice sign their returns, taxpayers spoke their names and SSNs into the telephone during the TeleFile phone call. The TeleFile system recorded the voice signature on an optical disk that lets IRS retrieve and replay the signature.

To allow taxpayers to use this innovative signature, IRS' Chief Counsel obtained temporary regulations that permitted voice signature as the legal jurat for TeleFile returns from Cincinnati District taxpayers during the 1993 filing season. Research Division secured a waiver from the Commissioner of IRS relinquishing the requirement for these taxpayers to submit paper Form(s) W-2 during the test.

For the 1993 filing season, the IRS mailed TeleFile tax packages to all Ohio taxpayers who in 1992 filed using TeleFile, filed using a Form 1040EZ or were eligible to file a Form 1040EZ. Cincinnati and Cleveland District taxpayers received slightly different tax packages because Cincinnati District taxpayers who used TeleFile voice signed their returns instead of sending in written signatures. Taxpayers who received the TeleFile tax package and whose name and address were still the same as the mail label on the tax package were eligible to use TeleFile.

Each tax package included a "Form 1040-TEL" (non voice signature) or "TeleFile Worksheet " (voice signature) as illustrated in Figures 1 and 2. The Form 1040-TEL is a form that taxpayers must complete and mail to the IRS. The

Figure 1



Form 1040-TEL TeleFile Income Tax Return for Single Filers With No Dependents 1992

Attach the IRS Label

If the label is not correct you cannot use TeleFile this year — Use Form 1040EZ

1 Fill in Lines A, B, C, D, and E

A Do you want $1 to go to the Presidential Election Campaign Fund? Checking "Yes" will not change your tax or reduce your refund. YES NO

B Can your parents (or someone else) claim you on their 1992 tax return?

C Enter total wages, salaries, and tips. This should be shown in box 10 of your W-2 form(s). Attach Copy B of your W-2 form(s). DOLLARS ONLY

D Enter Federal withholding from box 9 of your W-2 form(s)

E If you had taxable interest income, enter the total dollar amount from your 1099-INT form(s) or other statements. If the total is more than $400, you cannot use TeleFile or Form 1040EZ

STOP JUST FILL IN A, B, C, D, AND E BEFORE CALLING TELEFILE STOP

2 Gather Your Mail Label and This Form and Call TeleFile 24 Hours a Day at 1-800-829-5166

- TeleFile will tell you what information you need to enter from your mail label and this form.
- Enter dollars only for all money amounts. Press the number sign (#) after each money amount.
- TELEFILE WILL TELL YOU THE FOLLOWING AMOUNTS. PLEASE ENTER THE AMOUNTS IN THE SPACES PROVIDED.

Adjusted Gross Income (AGI). You will need this figure for your State of Ohio income tax return

Amount of your refund

OR

Amount you owe. Use the payment voucher that follows the forms. Payments must be postmarked by April 15, 1993

You must stay on the line until TeleFile tells you your return has been accepted and gives you a confirmation number. If you hang up before this, your return and refund will NOT be processed.

3 Sign and Mail This Form

- Sign and date this form, attach Copy B of your W-2(s) and the IRS label, and mail them as soon as possible in the envelope found in this booklet. KEEP A COPY FOR YOUR RECORDS.

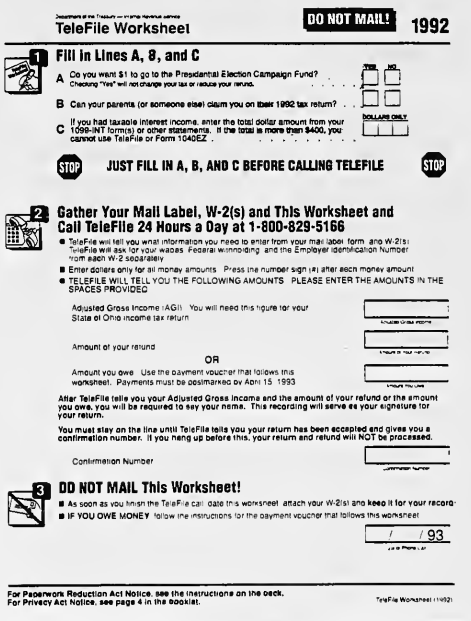
I have read this return. Under penalties of perjury, I declare that to the best of my knowledge and belief the return is true, correct, and complete

Your signature Date

For Paperwork Reduction Act Notice, see the instructions on the back.
For Privacy Act Notice, see page 4 in the booklet.

Form 1040-TEL (1992)

Figure 2



TeleFile Worksheet DO NOT MAIL! 1992

1 Fill in Lines A, B, and C

A Do you want $1 to go to the Presidential Election Campaign Fund? Checking "Yes" will not change your tax or reduce your refund. YES NO

B Can your parents (or someone else) claim you on their 1992 tax return?

C If you had taxable interest income, enter the total dollar amount from your 1099-INT form(s) or other statements. If the total is more than $400, you cannot use TeleFile or Form 1040EZ DOLLARS ONLY

STOP JUST FILL IN A, B, AND C BEFORE CALLING TELEFILE STOP

2 Gather Your Mail Label, W-2(s) and This Worksheet and Call TeleFile 24 Hours a Day at 1-800-829-5166

- TeleFile will tell you what information you need to enter from your mail label, form, and W-2(s). TeleFile will ask for your wages, Federal withholding, and the Employer identification Number from each W-2 separately.
- Enter dollars only for all money amounts. Press the number sign (#) after each money amount.
- TELEFILE WILL TELL YOU THE FOLLOWING AMOUNTS. PLEASE ENTER THE AMOUNTS IN THE SPACES PROVIDED.

Adjusted Gross Income (AGI). You will need this figure for your State of Ohio income tax return

Amount of your refund

OR

Amount you owe. Use the payment voucher that follows this worksheet. Payments must be postmarked by April 15, 1993

After TeleFile tells you your Adjusted Gross Income and the amount of your refund or the amount you owe, you will be required to say your name. This recording will serve as your signature for your return.

You must stay on the line until TeleFile tells you your return has been accepted and gives you a confirmation number. If you hang up before this, your return and refund will NOT be processed.

Confirmation Number

3 DO NOT MAIL This Worksheet!

- As soon as you finish the TeleFile call, date this worksheet, attach your W-2(s), and keep it for your records.
- IF YOU OWE MONEY, follow the instructions for the payment voucher that follows this worksheet.

/ /93

For Paperwork Reduction Act Notice, see the instructions on the back.
For Privacy Act Notice, see page 4 in the booklet.

TeleFile Worksheet (1992)

TeleFile Worksheet is for the taxpayer's records and guides them through the TeleFile phone call. The packages also included instructions, a personal identification number (PIN), and the phone number necessary to use the TeleFile system. Both tax packages look extremely different from the Form 1040EZ as they contain vivid color and graphics to grab the taxpayers' attention and make the instructions easy-to-follow.

Using TeleFile

The process for filing a TeleFile return included filling out the Form 1040-TEL or TeleFile Worksheet and calling the TeleFile system. In the Cleveland District, the method for using TeleFile in 1993 remained basically the same as in 1992. On the Form 1040-TEL, taxpayers answered five questions regarding the Presidential Election Campaign Fund (PECF), dependent status, interest income, wages and withholding. Taxpayers also totaled their wage and withholding information from Form(s) W-2 before calling TeleFile. Cincinnati District taxpayers answered only three questions using the TeleFile Worksheet about PECF, dependent status and interest income. Both the Form 1040-TEL and TeleFile Worksheet then instructed the taxpayer to call a toll-free phone number to access the TeleFile system.

When the taxpayer called the toll-free phone number, a voice response system greeted her and prompted her to enter the information from the Form 1040-TEL or TeleFile Worksheet. First, the system prompted the taxpayer to enter identifying codes from the mail label on the tax package. The TeleFile system verified the information and then prompted the taxpayer to enter the information from either the Form 1040-TEL or TeleFile Worksheet. Cincinnati District taxpayers also entered wage and withholding information from individual Forms W-2 instead of entering totals.

The TeleFile system then calculated the tax owed and told the taxpayer her adjusted gross income (AGI) and refund or amount owed. At this point during the phone call, the taxpayer could either file the return or hang up. This was a new feature in 1993. If the taxpayer terminated the call, the TeleFile system did not save the information entered by the taxpayer, but the taxpayer could call again and start over.[4]

Taxpayers who chose to file their returns in 1993 received one of two messages. The TeleFile system gave Cleveland District taxpayers a six-digit confirmation number and instructed them to sign and mail Form 1040-TEL with the appropriate Form(s) W-2. TeleFile prompted Cincinnati District taxpayers to record their names and SSNs and then issued a confirmation number. The confirmation number was also a new feature in 1993. During focus group interviews after the 1992 filing season, taxpayers indicated that they wanted a sense of closure at the end of the phone call. In focus groups conducted after the 1993 test, taxpayers said they liked the confirmation number; it gave them proof that they filed their returns with the IRS.

Once the taxpayer filed the return with TeleFile, the system sent it to EFS for processing as an electronic return. EFS processes returns without manual input of data as required with paper returns. EFS is a series of computers that verify the data and then send it to the IRS master files. TeleFile returns appear to the EFS the same as electronic returns from any authorized transmitter. As TeleFile returns are processed by EFS, taxpayers who used TeleFile received refunds in about 3 weeks.

Taxpayer Burden Reduced

The IRS' Strategic Business Plan defines taxpayer burden as the time, expense and dissatisfaction experienced by taxpayers who attempt to comply with Federal tax laws.[5] This burden includes the time and cost expended by taxpayers to become familiar with the tax law, read publications, learn filing requirements, maintain records, pay for tax return preparation and the time and postage to mail tax return documents to the IRS. Taxpayer burden also includes the amount of time it takes taxpayers to receive their refunds.

A primary goal of TeleFile is to alleviate taxpayer burden. Using a telephone call as the medium for filing combined with the EFS to process the data, TeleFile can enable millions of taxpayers with simple returns to file from home. In addition, taxpayers can obtain the benefits of fast and accurate return filing and quicker refunds without using a preparer or electronic return transmitter.

Each year, the IRS provides to the Office of Management and Budget the estimated average time required for an individual to prepare his tax form. Table I shows estimates from the 1993 test for TeleFile with and without voice signature and for the Form 1040EZ.[6]

Table 1
Burden Estimates for TeleFile vs. Form 1040 EZ (Data in Minutes)

Activity	TeleFile		Form 1040EZ
	Voice Signature	Form 1040-TEL	
	(1)	(2)	(3)
Recordkeeping	7	7	5
Learning about law or form	4	5	33
Preparing form/worksheet	10	13	39
Phone call	7	5	N/A
Copy, assemble, mail form	N/A	15	34
TOTAL	**28**	**45**	**111**

As illustrated above, TeleFile is significantly less burdensome than the Form 1040EZ. TeleFile with voice signature requires only 25 percent of the time required to file a Form 1040EZ. Even with the submission of the Form 1040-TEL signature document, TeleFile requires only 40 percent as much time as the Form 1040EZ.

During the 1993 filing season, the EFS accepted 148,585 TeleFile returns. Of those, 69,282 were voice signature returns from the Cincinnati District and 79,303 were from the Cleveland District. This represents savings of 83 minutes for each voice signature return and 66 minutes for each TeleFile return filed with Form 1040-TEL. In total, taxpayers who used TeleFile during the 1993 filing season saved 183, 073 hours of their time.

On the basis of IRS projections for TeleFile returns (which essentially reflect extrapolations of existing TeleFile volumes), an anticipated 5,642,400 taxpayers will use TeleFile by the year 2000.[7] If all taxpayers can use voice signature, they will save an estimated 7,805,320 hours to file their tax returns.

In addition to shorter preparation times and not having to mail anything for voice signature returns, TeleFile provides taxpayers the benefits of electronic filing without the burden of incurring the cost of preparers or electronic return transmitters. For example, in filing year 1992, the median fee charged to file a return electronically was $22.[8]

According to a survey of taxpayers who used TeleFile during the 1992 filing season, 98 percent would not have used electronic filing and 94 percent would not have used professional return preparation services.[9] Each of these taxpayers avoided paying $22 but still received all the benefits of electronic filing including faster refunds and fewer errors during processing. If the cost of electronic filing remained constant at $22, taxpayers would avoid paying $124 million in the year 2000.[10] Even if the cost of electronic filing dropped to $10 per return, taxpayers would still avoid paying $56 million while enjoying the benefits of electronic filing, including faster refunds and fewer errors.

Beyond the time and money taxpayers save in preparing their returns, TeleFile also reduces taxpayer burden by providing faster refunds than paper Forms 1040EZ. Taxpayers reported receiving their refunds faster with TeleFile than when they filed paper returns.[11] IRS corroborated this data by analyzing when refund checks were mailed for TeleFile and the various methods used to process Forms 1040EZ. TeleFile refunds averaged 22 days, and the Form 1040EZ refunds varied from 27 (scanned returns) to 32 days (manually processed).[12]

Electronic Filing Volume Increased

Increasing electronic filing volumes is an integral piece of the IRS' business vision. Based on existing trends, IRS will process an anticipated 30,167,300 individual electronic returns annually by the year 2000.[13] Overall, TeleFile will contribute 18.7 percent of the total 30 million electronic returns expected.[14]

In the survey of taxpayers who used TeleFile during the 1992 filing season, 98 percent indicated that they would **not** have used electronic filing if TeleFile had not been available. Thus, TeleFile introduces taxpayers who normally would file by paper to IRS' electronic filing system.

Fraud Free Returns

A significant concern about electronic filing is the amount of fraud perpetrated by dishonest taxpayers. Of the 125,969 TeleFile returns filed the first year of the test and the 148,585 TeleFile returns filed the second year, IRS found no fraud. In contrast, a significant amount of fraud has been detected in electronically filed and regular paper returns.

As no fraud has been detected in the TeleFile system during the 2-year test, it appears that TeleFile provided adequate security measures during the test. However, it is critical to realize that IRS must review security measures each year to ensure the integrity of the system. As TeleFile expands and the public becomes more familiar with the system, TeleFile will become more susceptible to fraud. Using EFS as an example, it is crucial to continue changing and expanding TeleFile's security measures. If not, fraudulent filers will "learn the system" and find ways to file fraudulent TeleFile returns.

Conclusion

The lessons learned during the 2-year TeleFile test indicate that TeleFile meets its goals of reducing taxpayer burden and increasing electronic filing volumes. Also, it demonstrates that taxpayers are willing to file their individual income tax returns using TeleFile.

While TeleFile with the Form 1040-TEL considerably decreases taxpayer burden, voice signature lowers it drastically. The 1993 test illustrated that taxpayers are comfortable using voice signature, and voice signature reduces the number of signature documents and Forms W-2 required to file the return to zero.[15]

Though still in a pilot mode, TeleFile shows clear promise in helping the IRS achieve its business vision. During the 1994 filing season, IRS expanded TeleFile availability to Florida, Indiana, Kentucky, Michigan, South Carolina and West Virginia, in addition to Ohio.

Endnotes

[1,2]1,200 responses from TeleFile users; 99% confidence level; +/- 5% accuracy.

[3] See related article in this publication "Signing Your Name...Electronically!" by Donna Camp-Blair.

[4] During the 1992 filing season, many taxpayers thought they would have an opportunity at the end of the call to change information or get out of the system. However, as soon as TeleFile reported the refund or amount owed to the taxpayer, the system saved and filed the return. As a result, some taxpayers filed duplicate returns in 1992 because they did not originally intend to file the TeleFile return.

[5] "Strategic Business Plan, FY 1992 and Beyond," Department of the Treasury, Internal Revenue Service, Document 7655 Revised (9-91), Catalog Number 12653J.

[6] Package 1040EZ-2, Catalog Number 13545C; Package 1040EZ-3, Catalog Number 13545C; Package 1040EZ, Catalog Number 12063Z.

[7] "Calendar Year Projections of Individual Returns By Major Processing Categories," Document 6187 (Rev. 9-93), Catalog Number 44972B.

[8] General Accounting Office, "Tax Administration: Opportunities to Increase the Use of Electronic Filing," January 1993.

[9] 1,200 responses from TeleFile users; 99% confidence level; +/- 5% accuracy.

[10] Based on projection of 5,642,400 returns from "Calendar Year Projections of Individual Returns By Major Processing Categories," Document 6187 (Rev. 9-93), Catalog Number 44972B.

[11] TeleFile focus groups, 1992 and 1993.

[12] Per IRS Internal Audit Report, July 1992.

[13] "Calendar Year Projections of Individual Returns By Major Processing Categories," Document 6187 (Rev. 9-93), Catalog Number 44972B.

[14] Based on projections of 5,642,400 TeleFile and 30,167,300 total electronically filed individual returns from "Calendar Year Projections of Individual Returns By Major Processing Categories," Document 6187 (Rev. 9-93), Catalog Number 44972B.

[15] Estimating two Forms W-2 on average for each TeleFile return, plus the signature document, 16,927,200 fewer pieces of paper would enter IRS sites in the year 2000 if voice signature is available nationwide.

Sources of Tax Forms and Ordering Patterns for Tax Forms, Instructions , and Publications

by Denise York Young and Erika D. Alexander

Data gathered from tax returns filed during 1992 were analyzed to determine where taxpayers secured Forms 1040, 1040A, and 1040EZ and Schedule EIC filed. The preferred source for non-practitioner-prepared returns was the tax packages mailed directly to individuals, i.e., 52 percent, Form 1040; 67 percent, Forms 1040A; and 63 percent, Form 1040EZ. However, for practitioner-prepared returns, the primary source was privately generated replicates—many presumably created from computer software. In terms of return rates, about 33 percent of total Forms 1040 originally mailed out are filed with IRS, compared to about 45 percent for 1040A, and about 42 percent for Form 1040EZ. In addition, ordering patterns for tax products from the IRS Distribution Centers in 1992 indicated that taxpayers order, on average, 4.4 products per order, and 1.6 volume (copies) per product. The analysis of Distribution Center telephone and written orders for tax forms, instructions, and publications also revealed that Instructions 1040, Publication 17, Form 1040, Schedule D, and Form 1040ES were the tax products most frequently requested by individual taxpayers. When products that were ordered together were considered, the most frequently ordered combinations (one product ordered by itself or multiple products ordered together) were Form 1040X and Instructions 1040X, Form 1040ES (by itself), Publication 17 (by itself), Form 1040EZ and Instructions 1040EZ, and Form 5329 and Instructions 5329.

Introduction

Taxpayers can obtain tax forms from many sources. Among these are tax packages mailed directly to taxpayers, banks, post offices, libraries, and IRS offices. Tax forms also can be obtained by making copies from either Package X or from the reproducible forms provided to libraries and practitioners. In addition, tax forms are sold by commercial vendors. Source codes (e.g., 1 for 1040 package 1, B for bank) are printed on selected tax forms. For purposes of resource and program management, the IRS needs to know the extent which each of these types of distribution outlets is used.

This article first discusses the usage of different sources of individual income tax forms. It then considers one particular source of tax products—IRS Area Distribution Centers—and explores the ordering patterns for the full range of tax forms, instructions, and publications. During a tax filing season the three Area Distribution Centers process more than 5 million telephone and written requests for tax materials through the Centralized Inventory Distribution System (CIDS). Understanding the sources of forms used by taxpayers and their ordering patterns on CIDS enables the IRS to make operational and administrative decisions to better serve the public.

Methodology

The Statistics of Income (SOI) Division annually conducts the Taxpayer Usage Study (TPUS) which considers individual income tax returns filed during the main filing season. For the 1992 filing season, TPUS consisted of a random systematic sample of 9,722 individual tax returns (8,441 paper returns and 1,281 electronic returns). After performing consistency checks and developing weights for the data, SOI provided the authors with a data file consisting of information collected from the 9,722 returns. This data file was the basis for the analysis of source codes, which is discussed in the first portion of this article. Although information on source codes was obtained from 20 different tax forms and schedules, this article is concerned only with sources of Forms 1040, 1040A, and 1040EZ (the major individual return types) with a brief mention of Schedule EIC.

The data on ordering patterns of tax forms, instructions, and publications were obtained from a random systematic sample consisting of 235,441 orders placed at the three Area Distribution Centers during the 1992 filing season (January 1 to April 15, 1992) and entered into CIDS. The latter part of this article presents the results of the analysis of this sample.

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Definition of Sources

The sources of Forms 1040, 1040A, and 1040EZ and Schedule EIC filed with the IRS were identified as belonging to one of the following categories: 1) tax package, 2) bank, 3) post office, 4) library, 5) IRS office or distribution center, 6) reproducible proof (obtained from IRS), 7) practitioner reproducible (based on Publication 1579), 8) Package X, 9) filed electronically, and 10) other. With a few important exceptions, the forms in these 10 categories had unique preprinted codes associated with them that were captured as part of the Taxpayer Usage Study. Electronically filed forms did not contain a source code. Thus, this study could not provide information about the source of the paper document used for tax computations prior to electronic filing. For purposes of this analysis, these returns were simply identified as electronically filed and whether or not they were prepared by a paid practitioner. It also should be noted that electronically filed returns for the 1992 filing season were considered Form 1040 returns. In another exception, those returns that were not electronically filed and did not contain a source code were placed into the "other" category. Forms printed privately do not have a source code, and consequently, were placed in this category. It is generally believed that the majority of forms in the other category were printed from computer software packages.

Practitioner-Prepared Returns

The need for assistance from practitioners in preparing returns is largely a function of the complexity of the taxpayer's tax situation. One indication of that complexity is which of the three major individual return types the taxpayer submits. Not surprisingly, the proportion of Form 1040 returns with paid-preparer signature is much higher than for Form 1040EZ. Based on TPUS for filing season 1992, the proportions of Forms 1040, 1040A and 1040EZ with a paid-preparer signature were 63 percent, 20 percent, and 3 percent, respectively.

Sources for Forms 1040, 1040A, and 1040EZ

Table 1 contains the percentages of Form 1040 filed that were obtained from each source. There was a clear difference between the sources of non-practitioner-prepared Form 1040 and practitioner-prepared Form 1040. About 52 percent of all non-practitioner-prepared Form 1040 were from tax packages, whereas only 7 percent of practitioner-prepared Form 1040 were from tax packages. The second highest source of non-practitioner-prepared Form 1040 (13.9 percent) was electronically filed returns. It is not evident from Table 1, but approximately 30 percent of all electronically filed returns from TPUS were not prepared by a practitioner. This fact could have a bearing on the way the IRS provides tax forms to electronic filers. Interestingly, over half of practitioner-prepared Form 1040 (52.4 percent) did not have a source code, and are listed in the table as "other", which suggests the major role played by tax preparation software. The reproducible proof and electronically filed categories were essentially tied for the second highest categories for practitioner-prepared Form 1040 at about 16 percent each.

Table 1
Sources of Form 1040
(95 Percent Confidence Intervals)

Source	Non-Practitioner Prepared (n=2,105)		Practitioner Prepared (n=3,744)		All Form 1040 (n=5,849)	
	(1)	(2)	(3)	(4)	(5)	(6)
Tax Package	52.2% ±	2.1%	7.1% ±	0.8%	23.0% ±	1.1%
Filed Electronically	13.9% ±	1.5%	16.0% ±	1.2%	15.3% ±	0.9%
Other	10.7% ±	1.3%	52.4% ±	1.6%	37.7% ±	1.2%
Post Office	6.3% ±	1.0%	2.1% ±	0.5%	3.6% ±	0.5%
Library	6.1% ±	1.0%	0.6% ±	0.3%	2.6% ±	0.4%
IRS Office or Distribution Center	6.0% ±	1.0%	3.4% ±	0.6%	4.3% ±	0.5%
Bank	2.4% ±	0.7%	0.5% ±	0.2%	1.2% ±	0.3%
Reproducible Proof	1.9% ±	0.6%	16.8% ±	1.2%	11.5% ±	0.8%
Practitioner Reproducible (Pub 1579)	0.4% ±	0.3%	0.5% ±	0.2%	0.5% ±	0.2%
Package X	0.2% ±	0.2%	0.6% ±	0.2%	0.4% ±	0.2%
Totals	100.0%		100.0%		100.0%	

n=number of Form 1040

Table 2 contains the percentages of Form 1040A filed that were obtained from different sources. About two-thirds (67.1 percent) of non-practitioner-prepared Form 1040A were from tax packages. Post offices (10.6 percent) and libraries (8.3 percent) were the next highest sources and which ranked above IRS offices/distribution centers (6.6 percent) as preferred sources for non-practitioner-prepared Form 1040A. For practitioner-prepared Form 1040A, the primary sources were "other" (33.7 percent) and tax packages (29.4 percent). In contrast, these sources for practitioner-prepared Form 1040 were considerably different (52.4 percent for "other" and 7.1 percent for tax packages).

Table 2
Sources of Form 1040A
(95 Percent Confidence Intervals)

Source	Non-Practitioner Prepared (n=1,805)		Practitioner Prepared (n=405)		All Form 1040A (n=2,010)	
	(1)	(2)	(3)	(4)	(5)	(6)
Tax Package	67.1% ±	2.3%	29.4% ±	4.4%	59.2% ±	2.1%
Post Office	10.6% ±	1.5%	6.6% ±	2.4%	9.6% ±	1.3%
Library	8.3% ±	1.3%	3.5% ±	1.8%	7.3% ±	1.1%
IRS Office or Distribution Center	6.6% ±	1.2%	10.6% ±	3.0%	7.5% ±	1.2%
Bank	4.0% ±	1.0%	1.2% ±	1.0%	3.4% ±	0.8%
Other	1.9% ±	0.7%	33.7% ±	4.8%	9.6% ±	1.2%
Reproducible Proof	1.0% ±	0.5%	12.1% ±	3.2%	3.3% ±	0.8%
Practitioner Reproducible (Pub 1579)	0.3% ±	0.3%	1.8% ±	1.2%	0.6% ±	0.3%
Package X	0.1% ±	0.2%	0.6% ±	0.8%	0.3% ±	0.2%
Filed Electronically	0.0% ±	0.0%	0.0% ±	0.0%	0.0% ±	0.0%
Totals	100.0%		100.0%		100.0%	

n=number of Form 1040A

Table 3 contains the percentages of Form 1040EZ filed that were obtained from different sources. Non-practitioner-prepared Form 1040EZ followed a pattern similar to non-practitioner-prepared Form 1040A with tax packages as the

overriding source (63 percent) followed by post offices (14.7 percent) and then libraries (9.6 percent). However, because so few Form 1040EZ involve practitioners, only 62 practitioner-prepared Form 1040EZ were contained in the sample. As a result, the margin of error is substantially higher for these percentages and therefore it is more difficult to draw conclusions about where Form 1040EZ was obtained by those who use a practitioner. Still, in line with the corresponding results for Forms 1040 and 1040A, the category "other" is a substantial source for practitioner-prepared Form 1040EZ (estimated at 41.5 percent).

Table 3
Sources of Form 1040EZ
(95 Percent Confidence Intervals)

Source	Non-Practitioner Prepared (n=1,801)		Practitioner Prepared (n=62)		All Form 1040EZ (n=1,863)	
	(1)	(2)	(3)	(4)	(5)	(6)
Tax Package	63.0%	± 2.2%	20.5%	± 10.1%	61.4%	± 2.2%
Post Office	14.7%	± 1.6%	5.2%	± 5.5%	14.3%	± 1.6%
Library	9.6%	± 1.4%	8.4%	± 8.9%	9.6%	± 1.3%
IRS Office or Distribution Center	5.4%	± 1.0%	11.2%	± 7.9%	5.7%	± 1.0%
Bank	5.1%	± 1.0%	0.0%	± 0.0%	4.9%	± 1.0%
Reproducible Proof	0.9%	± 0.4%	13.2%	± 8.4%	1.3%	± 0.5%
Other	0.7%	± 0.4%	41.5%	± 12.3%	2.2%	± 0.7%
Package X	0.3%	± 0.3%	0.0%	± 0.0%	0.3%	± 0.2%
Practitioner Reproducible (Pub 1579)	0.3%	± 0.2%	0.0%	± 0.0%	0.3%	± 0.2%
Filed Electronically	0.0%	± 0.0%	0.0%	± 0.0%	0.0%	± 0.0%
Totals	100.0%		100.0%		100.0%	

n=number of Form 1040EZ

General Observations on Sources

Examination of Tables 1, 2, and 3 indicates several significant points about where taxpayers obtain their tax forms. Categories for post offices and libraries contained larger percentages for Forms 1040A and 1040EZ than for Form 1040. This could be because only tax packages containing Form 1040 were sent to a forwarding address. Since there is more movement between forms for filers of Forms 1040EZ and 1040A than for Form 1040, it is not cost-effective for IRS to pay postal forwarding fees on packages containing Forms 1040EZ and 1040A. Thus, filers of Forms 1040EZ and 1040A may have a greater need to obtain forms from non-tax package sources such as post offices and libraries. Also, first-time filers (who can not be mailed tax packages in advance) are more likely to need Form 1040EZ than the other forms.

In addition, the relative ranking of sources for practitioner-prepared returns was different than that for non-practitioner-prepared returns. Currently, recipients of certain tax packages who file a practitioner-prepared Form 1040 receive a postcards instead of an actual tax package. The postcard states that since the taxpayer filed a practitioner-prepared return the previous year, the IRS is not automatically sending a tax package. However, the postcards may be returned to request that a package be sent. This use of postcards undoubtedly contributes to the results that indicate that tax packages were not a major source of forms for practitioner-prepared Form 1040 returns.

Analysis also revealed that post offices and libraries were preferred by taxpayers over banks as forms distribution outlets. Information from this study was combined with data on the number of bank, post office, and library locations that distribute tax products so that the number of returns that were filed per location could be computed. For each library location, nearly 300 returns were filed containing a form that was obtained from a library. This compared with 162 returns per post office location and only 65 returns per bank location. Further analysis is underway to determine if the traditional types and numbers of distribution outlets should be modified.

Some concerns have been raised internally by IRS staff about practitioners obtaining and using large volumes of forms from banks, post offices, and libraries that were intended for use by individual taxpayers. While this may have occurred in isolated incidents, the data do not lend support to the idea that practitioners, overall, used these outlets as a primary source of forms. Less than 4 percent of all practitioner-prepared Form 1040 contained a source code from a bank, post office, or library. The percentage was higher for Forms 1040A and 1040EZ; however, these sources still were considerably below other sources in popularity of use by practitioners—particularly the practitioners' apparent reliance on self generation of forms using computer software.

This study indicated low usage of Package X and the practitioner reproducible Publication 1579 for Forms 1040, 1040A, and 1040EZ and Schedule EIC. Because these particular forms were available from a variety of sources, they probably were not a good measure of the overall usage of Package X and Publication 1579. It might be more appropriate to measure the usage of Package X and Publication 1579 based on forms that are not contained in tax packages or widely distributed in libraries, post offices, etc.

Return Rate For Tax Package Forms

The "return rate" on forms in a tax package was computed as the number of a particular form filed from a tax package divided by the number of tax packages mailed with that form, and then multiplied by 100 to be expressed as a percentage. For example, about 48 million Form 1040 tax packages were mailed for the 1992 filing season and about 16 million Form 1040 returns were filed with a source code from a tax package. Thus, the Form 1040 package return rate was 33 percent. Similar computations for Forms 1040A and 1040EZ resulted in return rates of 45 and 42 percent, respectively. However, the return rate for Schedule EIC was less than 5 percent since it is widely included in various tax

packages. For the 1992 filing season, Schedule EIC was mailed in almost 75 million tax packages (each of the nine Form 1040 packages and both of the Form 1040A packages), yet less than 3.5 million Schedule EIC were filed with a tax package source code. A return rate as low as 5 percent raises questions about the cost-effectiveness of putting Schedule EIC in 75 million tax packages (nearly 14 million Schedule EIC were filed in calendar year 1992). This analysis suggests that consideration should be given to placing Schedule EIC in selected tax packages, and sending those tax packages to taxpayers who qualify for the earned income credit based on their previous year's tax return.

Ordering Patterns at Area Distribution Centers

The IRS Area Distribution Centers in Sacramento, CA; Bloomington, IL; and Richmond, VA are among the places that taxpayers can obtain tax forms, publications, and instructions. Although the preceding analysis showed that the Distribution Centers were not a major source for Forms 1040, 1040A, and 1040EZ, there are literally hundreds of other forms, schedules and publications needed by taxpayers that the Distribution Centers seek to serve. The remainder of this article is concerned with the analysis of ordering patterns based on a random sample of over 200,000 telephone and written orders placed with the three Area Distribution Centers during the 1992 filing season.

The terms *order*, *product*, and *volume* are somewhat confusing. For the purposes of this article, an *order* is any request for forms, instructions, or publications, or a combination thereof. A *product* is any distinct IRS form, instruction, or publication that can be identified by a distinct catalog number. *Volume* represents the total quantity of forms, instructions, or publications. For example, a taxpayer who calls and receives two copies of Schedule D, two copies of Form 2441, one copy of Instructions 2441, and one copy of Publication 17 comprises one order for four products with a volume of six.

General Observations on Orders

During the 1992 filing season (FS92) over 5.8 million orders were entered into the Centralized Inventory Distribution System (CIDS) at the three Area Distribution Centers. As seen in Table 4, these orders were for an estimated 24.4 million products, thus equaling an average of 4.2 products per order. The Eastern Area Distribution Center (Richmond) filled the largest share of total orders (39.6 percent) and had the largest number of products per order (4.3)

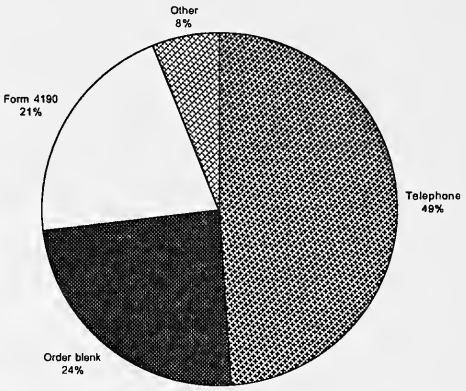
Table 4
Estimates by Area Distibution Center (ADC)

ADC	Number of Orders	Percent of Orders	Number of Products	Percent of Products	Avg. Products per Order
	(1)	(2)	(3)	(4)	(5)
Central	2,098,612	36.0%	8,432,321	34.5%	4.0
Eastern	2,310,055	39.6%	9,976,341	40.9%	4.3
Western	1,426,785	24.4%	5,993,829	24.6%	4.2
Total	5,835,452	100.0%	24,402,491	100.0%	4.2

Note: In this study, average is also the mean.

Orders are received in the distribution centers through various avenues (referred to as order subtypes). In FS92, an estimated 2.8 million of the orders were received via telephone, followed by order blanks (taxpayer written requests) at 1.4 million, and Form 4190 orders at 1.2 million. Form 4190 is an order form that is completed and mailed to the distribution center by IRS staff on behalf of a taxpayer when a telephone order is received at a Taxpayer Service site. As seen in Figure 1, these three avenues constituted approximately 94 percent of all the orders received throughout FS92.

Figure 1
Distribution by Order Subtype



Note: Form 4190 orders are received in Taxpayer Service sites by telephone and are sent to the Area Distribution Centers via mail. Other orders are mail orders not in previous category and various orders received via IRS tests.

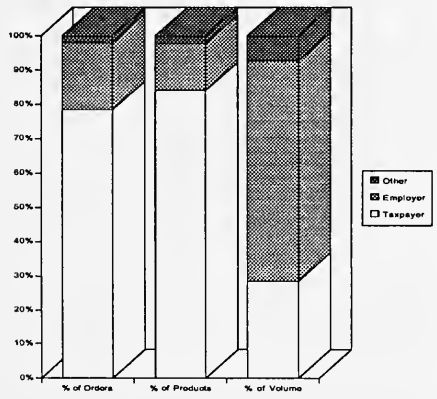
Table 5
Estimates by Order Type

	Number of Orders	Number of Products	Volume	Avg Products per Order	Avg Volume per Order	Avg Volume per Product
	(1)	(2)	(3)	(4)	(5)	(6)
Taxpayer	4,627,372	20,353,680	32,217,834	4.4	7.0	1.6
Employer	1,088,739	3,545,424	65,781,975	3.3	60.4	18.6
Other	119,341	503,387	7,828,356	4.2	65.6	15.6
Total	5,835,452	24,402,491	105,828,165	4.2	18.1	4.3

Note. In this study, average is also the mean.

In addition to order subtype, the "order type" data element can be used to identify who placed the orders. Individual taxpayers and employers represent the order types of most interest, as well as the vast majority of order types. In FS92, approximately 79.3 percent (4.6 million) of all the orders were placed by individual taxpayers for 20.4 million products (see Table 5). Employers placed approximately 1.1 million orders (18.7 percent of the total) for 3.5 million products. On average, taxpayers received 4.4 products per order and 1.6 copies per product for an overall average volume of 7.0 per order. In contrast, employees received 3.3 products per order and 18.6 copies per product for an overall average volume of 60.4 per order. The percent of orders, products, and volume by order type is shown in Figure 2. With respect to volume, employers order a much larger percentage than do taxpayers. A logical explanation is that taxpayers usually order for themselves whereas employers tend to order multiple copies for any number of employees.

Figure 2
Orders, Products, and Volume By Order Type



As seen in Table 6, 73.3 percent of all orders from the sample in FS92 were for 4 or less products, and 92.5 percent of the orders were for 10 or fewer products. The median number of products per order was 2. When analyzed by order type, approximately 91.4 percent of the orders placed by taxpayers were for 10 or less products. Employers, however, tend to order somewhat fewer products per order. In FS92, 97.2 percent of employer orders were for 10 or less products.

Table 6
Number of Products Ordered

Number of Products	All Order Types		Taxpayers		Employers	
	Pecent	Cumulative Percent	Percent	Cumulative Percent	Percent	Cumulative Percent
	(1)	(2)	(3)	(4)	(5)	(6)
1	27.2	27.2	27.4	27.4	23.9	23.9
2	24.7	51.9	23.5	50.9	30.3	54.3
3	13.3	65.2	12.3	63.2	17.9	72.1
4	8.1	73.3	7.9	71.1	9.3	81.5
5	5.9	79.2	6.0	77.2	5.5	86.9
6	4.3	83.5	4.5	81.7	3.6	90.6
7	3.4	86.8	3.5	85.2	2.7	93.3
8	2.4	89.2	2.6	87.8	1.8	95.2
9	1.8	91.0	1.9	89.7	1.3	96.4
10	1.5	92.5	1.6	91.4	0.8	97.2
>10	7.5	100.0	8.6	100.0	2.8	100.0

Analysis of Ordering Patterns

Of particular interest are the combinations of products ordered with one another. A combination may contain one product that is ordered by itself or multiple products that are ordered together. Table 7 outlines the top 30 combinations most frequently ordered by taxpayers. It should be noted that the figures for the analysis of ordering patterns are based on the number of orders for particular products. The volume of products is not represented in the tables. These 30 combinations account for 24.4 percent of all taxpayer orders placed during FS92.

Of the 4.6 million taxpayer orders placed, an estimated 145,836 of those orders were for Form 1040X and Instructions 1040X, placing it at the top of the most frequently ordered combinations. It is followed by Form 1040ES (by itself), Publication 17 (by itself), Form 1040EZ and Instructions 1040EZ, and Form 5329 and Instructions 5329. Publication 919 is sixth on the list of frequently ordered combinations from FS92. Since the title of Publication 919 is "Is My Withholding Correct", the large demand was probably due to the change in the withholding tables ordered by the President in March 1992. It is interesting to note that some of the most widely available forms through sources other than distribution centers (such as Forms 1040, 1040A and

1040EZ) are among the top products that taxpayers order. This suggests that the Distribution Centers offer convenience to some taxpayers.

Table 7
Most Frequent Combinations of Products Ordered by Taxpayers

	Combination			Orders
	(1)			(2)
1	F1040X	I1040X		145,836
2	F1040ES			116,738
3	P17			109,081
4	F1040EZ	I1040EZ		48,958
5	F5329	I5329		47,624
6	P919			42,881
7	P590			42,437
8	F1040A	I1040A		42,264
9	F8822			38,534
10	FSS-4			32,853
11	F8606			31,025
12	F4506			29,617
13	P15			28,357
14	F2106	I2106		28,159
15	F8283	I8283		27,196
16	I1040	Sch. D		27,073
17	F1040	I1040		26,850
18	F8829			25,986
19	P596			25,171
20	F8379			23,145
21	F8829	P587		22,404
22	F4868			22,305
23	I1099	F1096	F1099	21,688
24	F1040ES	N958	P505	18,575
25	F2119	P523	I2119	18,304
26	F1040	I1040	Sch. A&B	17,933
27	Sch. EIC			17,563
28	P525			17,488
29	Sch. EIC	P596		16,451
30	F2210	I2210		16,328
Total				1,128,824

F=Form
I=Instruction
P=Publication
N=Notice
Sch =Schedule

Actions Taken From Analysis of Ordering Patterns

One use of the data in Table 7 identifying combinations of products ordered together is determining what products could be combined into a tax package. However, simply because a form is among the top products ordered does not necessarily make it a candidate for a tax package. The cost, as well as the likelihood of taxpayers needing that form two years in a row must also be considered.

For many years, some suspected that given a long list of products to choose, many taxpayers would order every product on a Taxpayer Order Blank (TPOB). However, this analysis of the sample of 235,441 orders from FS92 revealed not one order for all 59 products on a TPOB. Furthermore, only 11.4 percent of TPOB orders requested more than 15 products. This fact, together with the data on combinations of products ordered, allowed the IRS to add additional products to the TPOB, thus eliminating many of the write-in requests which are often difficult to process. It also led to the removal of a few products that were ordered less frequently.

Analysis was also performed to determine the number of times a particular product was ordered. Table 8 displays the top 30 observations of this information for FS92. Upon inspection, one notices the large number of orders for Instruction 1040 at the top of the list. This was significantly higher than expected. After substantial investigation it was concluded that Instruction 1040 were automatically added to orders that contained any of the associated schedules of Form 1040. This was a departure from previous filing seasons. The policy was changed for the next filing season, and a savings of almost $100,000 was realized.

Table 8
Frequency of Products in Taxpayer Orders

	Product	Frequency
	(1)	(2)
1	I1040	1,001,142
2	P17	713,422
3	F1040	463,248
4	Sch. D	381,956
5	F1040ES	366,122
6	Sch. A&B	336,826
7	Sch. C	326,773
8	P590	319,042
9	I2106	297,230
10	I4562	295,724
11	F2106	295,230
12	F4562	292,389
13	P505	285,868
14	I1040X	279,939
15	P334	279,594
16	P529	277,914
17	F1040X	277,865
18	I1040A	266,502
19	P523	266,181
20	P917	257,906
21	Sch. SE	240,862
22	I2119	227,425
23	F1040A	227,029
24	F2119	226,017
25	I8283	225,177
26	F8283	223,423
27	Sch. E	222,114
28	P525	200,797
29	P463	184,148
30	P527	180,838

F = Form
I = Instruction
P = Publication
Sch. = Schedule
Frequency = the number of times a product was ordered

In addition to Instruction 1040, Publication 17, Form 1040, Schedule D, Form 1040ES, Schedule A and B, and Schedule C constitute the seven most frequently ordered products for the 1992 filing season. It should be noted that the number of orders in Table 8 cannot be summed together to obtain a total number of orders since any two or more products from the table could be from the same taxpayer order. For example, a taxpayer could order a Form 1040, an Instruction 1040, and a Publication 17. This is only one order, however the number of orders on Table 8 increases by one for each of the three products. In FS92, requests for 858 distinct products were in the sample of taxpayer orders.

Concluding Remarks

Data discussed in this report are only part of initial efforts in this area. Additional information with even greater refinements is being gathered to develop trends and predict demand for tax forms, instructions and publications. The information obtained through these studies will be disseminated throughout the IRS and used to reduce both cost and taxpayer burden.

Reducing Red Tape in Granting Installment Agreements: An Application of Process Analysis Techniques

by Deborah Diamond and Brad Wittman

A cross-functional study based on process analysis techniques in the Seattle District concluded that 37 percent of the activities in the installment agreement process were "non-value added." Short-term improvement opportunities resulted in staff year savings. The district is tracking the opportunity costs of expanded criteria for streamlined agreements, projected in the millions.

Introduction

The Seattle District, in coordination with the Chief Financial Officer's Office of Cost Management, completed the first district-office prototype of a combined process analysis/Cost Management Information System (CMIS) model application. The study, which focused largely on the IRS installment agreement process, took approximately 3 months and resulted in a comprehensive 182-page report which documents the process, the findings, and the recommendations. The following article is based on that study.

Definitions

The IRS **cost management information system** is being built from a series of studies which incorporate process analysis, value analysis, and activity-based costing, as defined below. The model, based on a series of cost management studies throughout the Service, will enable the IRS to project costs more scientifically and quantify the dollar impact of tactical and strategic decisions.

Process analysis involves a structured approach to mapping and analyzing a current process as the work actually flows across multiple organizational functions (i.e., cross-functionally).

Expanding on process analysis techniques, the IRS has developed a model of the organization's **core business systems** (CBS) which focuses on cross-functional processes, rather than traditional "stovepipe" functions. IRS' six core business systems are managing accounts, informing and educating, ensuring compliance, resourcing, value tracking, and developing and managing systems. The IRS has also identified 20 subsystems within its six core business systems. The 20 subsystems are further broken down into processes, then activities, and finally tasks.

The customer of each process is identified and the customer's needs defined. For this study, the ultimate **customer** is defined as the compliant taxpayer who files a correct return and pays any balance timely, without an additional expenditure of resources on the part of the IRS. The compliant taxpayer's expectation that others comply without an additional expenditure of IRS resources, in turn, influences the way in which the IRS deals with the needs of another customer, the less-compliant taxpayer. For example, the less-compliant taxpayer may want the longest possible term for an installment agreement; whereas, the compliant taxpayer would want the IRS to collect the balance due as quickly as possible with the least expenditure of resources.

A **value analysis** is performed to identify activities which are value-added (i.e., activities which contribute to customer satisfaction/value/worthiness, reduced taxpayer burden, or increased compliance) and non value-added (i.e., activities that can be reduced or eliminated without reducing the quality or responsiveness of the output).

Building on the customer-based process value analysis, **activity-based costing** techniques are used to calculate the full costs of cross-functional activities and "object costs" rather than accumulating traditional accounting costs by functions. Object costs are defined as the total labor and overhead costs of specific products or services.

Process value analysis reveals opportunities for improvement. Activity-based costing provides an additional piece of information for the decisionmaker to consider in deciding which improvement opportunities to implement. Cost is not determinative, but can now be considered along with impact on compliance, internal controls, etc. In this study, the installment agreement process was analyzed in detail and a value analysis performed. The unit cost of producing an installment agreement for the district and in each function was calculated.

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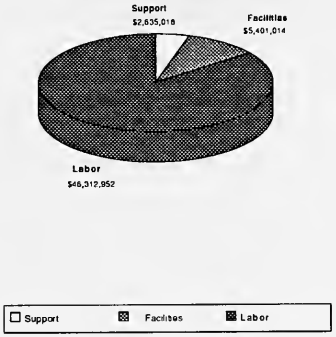
Methodology

A cross-functional IRS project team was assembled which included a consultant.[1] The team began by gathering information related to the district's total costs in fiscal year (FY) 1992. This total included costs for the district office subsumed within the regional and national office budgets. The Seattle District's total costs were approximately $54 million. The FY 1992 costs for labor (based on 1,181 staff years), facilities (e.g., rent, telecommunications), and support (e.g., travel, supplies, and enforcement expenses) were summarized in the form of a district financial statement and are presented in Figure 1.

Figure 1
Seattle District Office Costs



Through interviews with division, branch, and section chiefs, frontline managers and employees, costs in the traditional accounting format were re-arrayed by core business system down to the subsystem level. The "collecting" subsystem (within the ensuring compliance core business system) was chosen as the focus for the Seattle District prototype study, since the cost estimates indicated that over 20 percent of the district's resources were consumed in this subsystem.

During the study, the collecting subsystem was further broken down into three processes. In general, **contact with the taxpayer** begins when a balance due situation arises (e.g., return filed with a balance due, examination assessment, etc.) and ends with full payment or referral to the second process. The second process, **alternative action** begins with an acknowledged balance due not resolved in the prior process and ends with one of five collecting processes/products (full payment, an installment agreement, an offer in compromise, a bankruptcy proceeding, or a currently not collectible determination) or a referral to the third process. The third process, **enforcement action** begins with a balance due which has not been resolved through alternative action and ends (after levies, liens, seizures/sales) in full payment, case closure to another subsystem (e.g., an abatement of taxes), or a return to the alternative action process.[2]

The team then focused on the processes associated with installment agreements. They worked closely with a cross-functional focus group of subject-matter experts from Examination (Exam), Taxpayer Service (TPS), the Automated Collection Site (ACS), and the Collection Field function (CFf), frontline managers and employees who do installment agreements daily. Using their input, the project team prepared the following items:

1. A **high-level workflow** of the collecting subsystem. Instead of mapping vertically by function, the team mapped the processes horizontally (i.e., cross functionally) to graphically show duplicated efforts, multiple handoffs between functions, rework of cases by one function when unresolved by another function, relative time in process, etc.

2. A **functional narrative** defining the installment agreement (IA) process in Exam, TPS, ACS, and CFf for audiences unfamiliar with the actual functional process details.

3. **Activity definition matrices** detailing the inputs, activities, outputs, and customers of each of the processes and products. For example, the team determined that the IA process involves three activities: work up (dealing with the taxpayer), resolve (dealing with the paperwork), and monitor (tracking the taxpayer meeting the terms of the agreement). Examples of inputs to the work up activity are service center notices, Exam reports of deficiency and Tax Delinquent Accounts (TDAs); examples of outputs are an installment agreement, a financial statement, a referral to another function. The internal customers are management, the assistor, and other functional areas; the external customers are the delinquent taxpayer and the compliant taxpayer.

4. A **value-added/non-value added analysis** of each activity. At first, the focus group was reluctant to call anyone's work non-value-added. However, as the cross-functional dialogue progressed, it became clear that many time-consuming activities (often performed by one function but not another) appeared not to add value for the ultimate customer (the taxpayer). Examples of non value-added activities are: duplication of efforts, paper vs. automated system, rerouting, multiple layers of managerial review, and queue time (time cases wait to be worked on).

5. A **cycle time analysis** by function. This showed total cycle time from initial contact to closeout, cycle efficiency (value-added time/cycle time), conversion efficiency (cycle efficiency without queue time), and overall process efficiency.

6. A **driver analysis** of each non value-added activity. Drivers are the underlying root causes which require that the non value-added activities be performed. Examples of drivers are internal controls/procedures, budget constraints, historical precedent, computer limitations, lack of empowerment, taxpayer's inability to pay.

7. A list of short-and long-term **improvement opportunities**. This brainstormed list of improvement opportunities was put on a matrix with the non value-added tasks. The team then selected improvement opportunities which would reduce or eliminate the most non value-added tasks. Opportunities ranged from distributing payment coupon books to taxpayers with IAs (instead of sending monthly reminders) to charging the taxpayer a user fee for the cost of processing/monitoring an IA.

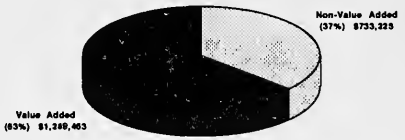
Throughout the study, the project team continuously validated its output with the focus group, with management reports, and with direct observations of employees performing the tasks.

Results

The team discovered that 37 percent of the activities in the installment agreement process were non-value added in the eyes of the ultimate customer (the compliant taxpayer). This percentage is typical of industries whose primary service is customer assistance (e.g., operations at a credit card service company). However, since approximately one-third of the IA cases involve reinstatements of defaulted IAs (non-value added rework), the actual non-value added percentage is much greater. Averages of value-added working time on installment agreement cases in Seattle District varied from: 15 minutes over the course of 3 days in ACS; 19 minutes over 4 days in TPS; 36 minutes over 5 days in Exam; and 58 hours over 375 work days in the CFf. These averages include queue time.

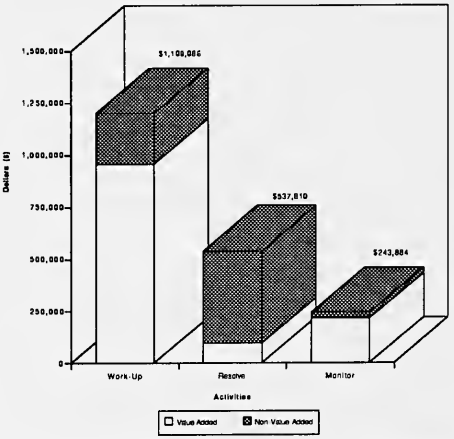
Spreadsheets of costs were prepared using Windows and Excel software; the data was then imported into EasyABC, an activity-based costing program. Traditional accounting costs--labor, facilities, and support--were gathered from district, regional, and national office management information systems. Based on management reports and interviews with division, branch, section, and frontline managers and employees, the traditional costs were allocated out to the branch level using the core business system architecture. Thus, the cost of the full time equivalents (FTEs) which TPS used to produce IAs was allocated to the ensuring compliance core business system, the collecting subsystem, and finally to the installment agreement process and activities. A report was generated which showed the number of resources each branch applied to each subsystem. Figures 2 and 3 graphically display the results of the value analysis.

Figure 2
Installment Agreement (IA) Costs
Costs of IA Alternative Action for FY 1992: $1,981,688



Note: Figure does not include contact or enforcement action cost of installment agreement.

Figure 3
Value Analysis
Costs of Installment Agreement Activities



Cost Expended

The costs that each branch expended on each core business system, subsystem, process, or activity were summarized. Of the total operating costs of $54 million, the Seattle District spent $33 million in the ensuring compliance core business system. Within ensuring compliance, $10.7 million was spent in the collecting subsystem with $6.4 million of that spent in the alternative action process. Of the $6.4 million spent on the alternation action process $2.9 million was spent on the installment agreement process.

Using process costs and volumes, product costs were eventually determined. This information offers the decisionmaker the opportunity to consider the cost/benefit of, for example, working low-dollar bankruptcies or devoting additional resources to cases likely to result in a CNC closure. However, cost is only part of the decisionmaker's equation. Legal requirements, long-term compliance, and managerial accountability must also be considered.

Costs of Installment Agreements

Considering the cost of installment agreements by function also provides interesting insights. Using our methodology, the average cost in Seattle District for an IA was approximately $50. Looking at the average cost by function, Seattle's TPS produces an IA for less than $10; ACS for less than $20; Exam for around $40; and Collection Field function for over $1,000. Clearly, differences in costs reflect differences in the complexity/difficulty of the cases handled by each function. However, decisionmakers can use the cost data to make more informed decisions. In this case, a cost-conscious decisionmaker with finite resources may want to reconsider where/how certain installment agreements are being worked. The decisionmaker would want to consider the value of recommendations to grant greater authority to TPS and ACS to enter into IAs before the willingness and ability to pay have passed. The CMIS model provides the cost data by process/product so that the use of servicewide resources can be maximized.

Recommendations and Actions

Using the improvement opportunities identified by process analysis and the cost information derived from activity-based costing, the team made six recommendations for changes:

1. Allow all functions to directly input IAs on the IRS Integrated Data Retrieval System (IDRS) rather than sending paperwork to the service center and having them input the data as much as 90 days later. This recommendation was implemented in Seattle District in all functions. Other functions are also considering such an approach.

2. Arrange for the service center to systemically produce the confirmation letter directly from input of the IA terms on IDRS rather than preparing letters manually at the district level. This recommendation was implemented in the Seattle District in all functions. Other districts/functions are considering a similar approach.

The estimated cost savings of #1 and #2 for Seattle's actions were 7.6 staff years ($224,622) with cycle times shortened by 4 days in CFf and shortened to 1 day in Exam, TPS, and ACS.

3. Raise the IA dollar limits to higher amounts for Exam, TPS, and ACS with no additional documentation. To test this new approach, these changes to normal procedures have been approved by the Chief Compliance Officer, Western Region, for Seattle.

The estimated cost savings of #3 relative to Seattle are over $44,000 in labor costs plus the potential for substantial additional collections, since many of the cases in question would be lower priority items in the revenue officers' inventories.

4. Use standardized, geographically based living expenses to reduce defaults and taxpayer burden. Seattle received approval from the National Office to test this approach in FY 1994. Results will be analyzed in FY 1995.

5. Allow a 10-day grace period and up to three partial installment payments before defaulting an agreement, thus eliminating the rework of reinstating an IA--an outcome which is not uncommon. The National Installment Agreement Task Force has also made recommendations to allow for greater leniency before defaulting an agreement. All recommendations are under consideration for nationwide implementation.

The estimated cost savings relative to Seattle of #4 an #5 are over $91,000 in labor costs from reduced rework and decreased taxpayer burden.

6. Charge the taxpayer who wants an installment agreement a user fee for the administrative processing costs. The IRS' FY 1995 budget proposal contained a provision for collecting user, as well as reinstatement, fees on IAs. If the user fee alone is approved by Congress, the provision would raise over $50 million in 1995.

Follow Up

In partnership with the CMIS project office, the Western Region sponsored a roll out of the process analysis/CMIS model to all Western Region offices in FY 1994. Each office was assigned a piece of the collecting process for study or validation.

In FY 1994, using FY 1993 data, the Seattle District studied the impact of the improvements which were implemented. Overall, the percentage of non value-added activities in the installment agreement process decreased from 37 percent in the June 1993 study of FY 1992 data to 23 percent in the June 1994 study of FY 1993 data. This decrease was largely comprised of the decrease in non value-added tasks in the resolve activity (e.g., preparation of paper IA and confirmation letter) from 83 percent to 48 percent.

However, unit costs actually increased to an average of $70. Labor, facilities, and support costs all rose in FY 1993. Thousands of taxpayers filed installment agreement requests with their returns as a result of introducing the new Form 9465-Installment Agreement Request in 1993. This eliminated the simpler, faster cases from TPS and ACS workload experienced prior to FY 1993. In addition, direct input of IAs and systemic requests for IA confirmation letters actually netted more staff year savings for the service center than the district.

By the end of FY 1994, most of the processes in the collecting subsystem [in Western Region] will be fully costed using the process analysis/CMIS model. Results are being shared with the collecting subsystem and collecting process "owners" (responsible IRS executives) as the studies are completed. It is anticipated that several of the recommendations will be incorporated into the CBS re-engineering proposals.

Endnotes

[1]The cross functional IRS project team included Robert Graumann, a consultant from Ernst & Young; Paul Schlesinger, an analyst from the national CMIS Project office; Brad Wittman, the Seattle District Controller; Deborah Diamond, the Seattle District Quality Improvement Coordinator; and Gail Sawyer, a management analyst in Seattle's fiscal office.

[2]CBS has since restructured the collecting subsystem to include the processes of: personal contact/enforcement, telephone contact/enforcement, pre-assessment account, bankruptcy processing, installment/suspended account monitoring, and international collection.

Preparing a National Public Service Information Campaign

by Anthony Burke

The 1993 Internal Revenue Service (IRS) National Public Service Campaign, "Answers. Assistance. At Your Service." reached the public through radio, TV and print advertisements. Developing a pubic service campaign to provide assistance on tax matters uses the talents of many individuals inside and outside of the IRS. For a successful campaign, it is important to engage creative talents, commission research to help the IRS better understand their audiences, produce messages that are clear and informative, secure generous placement from the media, and continue to track the receptivity of the messages by the public. In 1993, over 500 TV stations nationwide broadcast more than 22,000 IRS advertisements. A follow-up survey measuring the coverage of all IRS public service advertising, including the 1993 campaign, showed an estimated 67 million individuals over 18 years old had seen an IRS public service advertisement. The public service campaigns help reduce burden and improve voluntary compliance by providing tax tips and informing taxpayers how to obtain free tax assistance.

Introduction

During the tax filing season, the IRS National Public Service Information Campaign is one way the IRS provides tax information messages to the public. It includes a series of radio, television, newspaper and magazine public service advertisements backed up by other print devices such as buscards and posters. In addition to the public service campaign, the IRS produces full length television programs, arranges tax related radio call-in shows, and produces a variety of print material for use by the media.

Assisted by a full service advertising agency, the Communications Division, with the support of a Field Advisory Group of Public Affairs Officers representing each IRS region, creates the campaign. This article explains how a public service campaign is assembled and examines some of its impact. It should be particularly useful to IRS employees who communicate information about taxes to the public.

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The 1993 IRS National Public Service Information Campaign will be used to illustrate this process. This report will address selecting an advertising agency, designing the new campaign, public reaction to a communications strategy, using test results to highlight points in the IRS Strategic Business Plan, and determining the effectiveness of the campaign in terms of media coverage.

Selecting an Advertising Agency

Traditionally, the IRS had produced its own public service information campaign. The first IRS involvement with an advertising agency was in 1987 when it recognized the enormous task it had to communicate the 1986 Tax Reform Act to the American public. The Advertising Council took on the campaign. They agreed to a five-year partnership and, to produce the campaign, provided the volunteer services of McCann Ericson, one of the leading advertising agencies in the country. When the partnership ended, an executive decision was made to continue using the creative resources of an advertising agency. After evaluating the accomplishments and marketing abilities of three proposed advertising agencies - one large, one mid-size, and one small-the IRS chose Earle Palmer Brown, a full-service advertising agency.

Internal Campaign Groundwork

During 1992, Earle Palmer Brown, with the assistance of the Communications Division and the Field Advisory Group, held a series of interviews with all levels of IRS employees. The purpose of the internal research was to allow the advertising agency to better understand the IRS and to compare the findings with the public's perceptions.

From the internal results, Earle Palmer Brown recommended a communications strategy for the new public service campaign. The slogan for the campaign they suggested was "Answers. Assistance. At Your Service." The major points of the communications strategy were to increase taxpayer awareness of IRS customer service efforts, to clarify how the IRS works, to "humanize" the IRS organization, and to provide, in all advertising, information that is both useful and valuable to the target audience. The strategy was supportive of IRS objectives to increase voluntary compliance, reduce burden on taxpayers, and provide quality products and services.

Pre-Campaign Focus Group Testing

Next, the advertising agency tested the communication strategy — comprising radio, television spots and print advertisements, and the elements of the campaign- with the public through focus group discussions. Those elements tested included: developing creative approaches that dispel the most common myths and misconceptions about the IRS, listing all the information and support programs offered by the IRS, providing answers to the "Most Asked Questions," informing taxpayers of deductions that they have a right to take, and promoting the volunteer tax preparation program. Two focus group sessions were held in the following six cities: Providence, Rhode Island; Atlanta, Georgia; Miami, Florida; Florence, Kentucky; Minneapolis, Minnesota; San Diego, California.

One focus group comprised individuals who had at most attained a high school education, the other comprised those who had undergraduate or graduate level education. (All participants were English-speaking - bilingual from Miami and San Diego. These individuals who worked more than 30 hours per week outside the home and were subject to federal income tax withholding.)

Since the groups were not recruited with proportional representation in mind, no attempt was made to quantify the results. The purpose of focus-group testing is not to quantify, but to enable anyone in need of a market study to more completely understand the general sentiments of the public to whom the "product" would be marketed.

Using Focus Group Test Results

The ultimate result of the focus-group testing showed that reaching the public with the necessary tax information would be difficult. Earle Palmer Brown enumerated the following perceptions about the IRS that were important for forming the ongoing public service campaigns.

These perceptions included:

- Dissatisfaction with federal spending and other government practices adversely influences feeling about the government's tax collection agency.
- Whether shaped by personal experience, hearsay or the media, perceptions of the IRS continue to be negative.[1]
- Taxpayers feel frustrated and essentially powerless in their attempts to deal with the IRS. In any encounter with the IRS, they tend to feel guilty until proven innocent.
- There is a lack of confidence in the ability of the IRS to provide consistent, accurate tax information and guidance in a professional manner.
- Regardless of educational level, many taxpayers have somewhat inaccurate perceptions of the organization, management, motives, policies, and practices of the IRS.

Reaction to the Initial Communication Strategy

The focus groups expressed some favorable sentiments after seeing story boards depicting radio, TV, and print components of the public service campaign. Group members generally felt that they knew more about the IRS, and that the IRS was changing to become more customer service oriented. However, they said that the IRS had to prove that it was really changing.

Other reactions from focus group participants were:

- Group members liked the humorous elements of the campaign and felt that they helped to break the ice and give the IRS a more human face.
- Many group members who thought they knew all they needed to know from the IRS admitted they learned something new and useful from these advertisements.
- Nearly all group participants ultimately believed these ads are a sign of a change for the better, an indication of a more customer-oriented, healthy and responsible IRS.
- Many group members believed the IRS can continue to increase its credibility by communicating more with taxpayers, if not necessarily about its customer service achievements, at least about its plans.
- The burden of living up to the promises made in these ads lies squarely with the IRS.

Refinements to the Final Communication Strategy

These and other comments from focus group test results were incorporated into the final creative products. For instance, the public service announcements and ads were created with more humor to reach the public by breaking the

ice as the focus group suggested. One example is the 60-second radio spot about the free tax preparation assistance available to the public from volunteers trained by the IRS to help taxpayers.

OBSERVER: You know what I just heard? Eighty-five thousand people do volunteer work for the Internal Revenue Service. Now I can understand giving your time to some hospital or the P.T.A. or the S.P.C.A., but the IRS? That seems a little warped to me. It's like inviting the guy who rear ends you over for dinner. Think about it — these people don't just work for the IRS. They work for free. Reminds me of that guy who sat in the front row in the sixth grade and raised his hand for every single question, Yeah, like Russell Fralin. I'll bet old Russell grew up to be an IRS volunteer...

ANNOUNCER: It may be hard to believe, but thousands of people do help the IRS every year. Look for our trained Volunteer Tax Assistants in libraries, churches, malls and other convenient locations, January through April. They'll be glad to help you with your taxes. And while you might not understand someone volunteering for the IRS you will appreciate them. We do.

OBSERVER: ...hey, maybe they just got confused. Thought IRS stood for Insomniacs for Restful Sleep. Or Individuals to Rearrange Stonehenge. It's a splinter group...

ANNOUNCER: The Internal Revenue Service. Answers. Assistance. At your Service.

The Campaign and the Strategic Business Plan

Two of the IRS Strategic Business Plan's goals are reducing taxpayer burden and increasing voluntary compliance. The public service campaign sets its direction based on these two goals. Taxpayer burden is the time, expense, and dissatisfaction experienced by taxpayers, tax professionals, and others trying to comply with the tax laws. The public service campaign is designed to reduce burden by providing tax tips to the public and by informing taxpayers about the free help available to them from the IRS.

Because the public's willingness to meet tax responsibility is the foundation of our American tax system, it is imperative that we tell the public where they can get assistance. Taxpayers who do not know how to meet their tax obligation and who feel that there is nowhere to go for help are prone to file inaccurate returns or not file at all. Ensuring voluntary compliance is the most efficient and cost-effective approach to collecting revenue.

Implementing the Campaign

Once the initial research is completed and the communications strategy refined accordingly, implementation of the campaign follows. Storyboards, scripts, and mechanicals are drafted and presented to the IRS for final clearance. Upon approval, production begins. Television and radio ads are usually produced in Los Angeles and New York. Print ads are designed in-house by the advertising agency's graphic artists. Aesthetics and creativity are primordial in a medium deluged with thousands of ads competing for the public's attention. Ads are then reproduced and sent to hundreds of media outlets across the country. IRS Public Affairs Officers follow up with the media to ensure maximum usage of the ads.

Coverage Provided by the Campaign

At the end of the filing season, Earle Palmer Brown completed a taxpayer survey in which 2,208 telephone interviews were conducted to find out if people saw IRS advertisements. The population surveyed was randomly selected adults over 18 years old living in the continental United States. The sample reflected the actual proportionate geographic distribution of population across the seven IRS regions.

The follow-up survey found that over one-third of all respondents said that they had seen one or another form of public service advertising for the IRS during 1993. When respondents were asked if they had ever seen an IRS public service advertising message, 35.3 percent said they had, 62.8 percent said they had not and 2 percent said they did not know. Based on the survey results, it can be projected that of the estimated 190 million adults over the age of 18 more than 67 million adults saw the IRS advertisements.[2] Of those who recalled seeing an IRS advertisement, 82 percent remember seeing some form of IRS public service advertising on television. Their recall of radio and newspaper advertising was 19 percent and 20 percent, respectively.

To gauge the coverage given in the media of television and print, the IRS contracts the services of Nielsen's Broadcast Service and Burrelle's Clipping Service. The IRS does not pay for advertising placement, but rather relies on the generosity of local and national media. Competition is keen for scarce public service time, so the creativity and production value of the advertising are extremely important. Table 1 shows the different types of media coverage and an estimated cost of the total plays for each type. The figures for the television coverage resulted from the Nielsen's Broadcast Service. The radio estimates were from media feedback. The estimated values for the print media and billboards/buscards were calculated from the industry standards.

Table 1
1993 Campaign Media Coverage

Media Type	Number	Value (Est)
	(1)	(2)
Television Stations	502	
Plays	22,332	$7 million
Cable Networks	89	
Plays	33,642	$3 million
Radio Stations	6,000	
Plays	162,475	$9 million
Print (Daily and Weekly)		
Clippings	1,738	
Circulation	17 million	$1.3 million
Billboards/Buscards	1,845	553,000

Conclusion

The public service information campaign serves as an important instrument for informing and educating the public. To maximize its impact, many efforts by people inside and outside of the IRS are needed. These efforts include superior creative talents, research to help us better understand our audiences, messages that are clear and informative, generous placement from the media, and methods to track the receptivity of the messages by the public. The results of 1993 advertising campaign indicate that an estimated 67 million adults encountered the IRS advertisements with the majority reached through television.

Public service advertising can influence behavior. The challenge is for the IRS to live up to the promises made in its advertising.

Endnotes

[1] For a statistically representative measure of the public's perception of IRS performance, see The 1993 IRS Customer Satisfaction Survey, Price Waterhouse.

[2] The estimated 190 million adults over the age of 18 figure is from the **"1993 Annual Survey of Buying Power," Sales and Marketing Managers Magazine,** August 1993.

Signing Your Name...Electronically!

by Donna Camp-Blair

The use of electronic authentication technologies is necessary to fully develop a paperless electronic filing system. The Internal Revenue Service (IRS) is currently evaluating several biometric and cryptographic technologies, which includes a "live" test with TeleFile's voice signature, to replace handwritten signatures. This research is necessary for the IRS to discover why some alternatives work and others do not. At present, only voice signature and digitized handwritten signatures appear to meet public acceptability criteria for use with individuals.

Note: This article deals with technologies and issues that are changing rapidly. While every effort was made to make it accurate at the time of publication, significant changes may have occurred.

Introduction

As the IRS moves toward significantly increasing the use of electronic filing, the need for alternatives to a handwritten signature on individual tax returns increases. The IRS must, however, balance its needs for security and fraud prevention with more modern, cost-efficient ways of doing business. Electronic authentication techniques have the potential to make a truly paperless filing system possible. The IRS is investigating variations of both biometric and cryptographic technologies, such as voice verification, signature dynamics, and encrypted digital signatures.

While businesses and other government agencies are already using many of these techniques, the IRS' use of electronic identification technologies for individuals is a unique application of these technologies. When a non-IRS agency does use electronic authentication techniques with individuals, it is typically for some type of benefits delivery. The agency provides something, such as food stamps, that an individual wants. The individual is motivated to use the signature alternative since that is the only way to receive the benefit.

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> "Those people (using current electronic authentication systems) want to be identified and want to have access (to the benefits of those systems)."[1]

The IRS does not provide the same type of motivation for the public to use an alternative authentication technique.

This article summarizes the major alternatives to handwritten signatures and examines some of the associated issues involved from the perspective of filing returns.

Definitions

Signature alternatives are technologies designed to replace written original signatures. The term "electronic signature" means different things to different people. Some do not consider these technologies signatures, but prefer to call them "acceptable authentication techniques." The Government Accounting Office's (GAO) definition of an electronic signature is "...an electronic symbol that can be used to validate the sender's identity and the integrity of the critical information received from the sender."

In a decision on electronic signatures, GAO's Comptroller General establishes the following attributes as necessary for a binding electronic signature.[2] The electronic symbol must be:

- Unique to the signer
- Under the signer's control
- Capable of being verified
- Linked to the data being signed (i.e. the data cannot be changed without changing the signature)

Types of identification technologies include possessions (e.g., cards, badges), knowledge (e.g., personal identification numbers (PINs), and characteristics (e.g., voices or signature dynamics). These technologies are often used in combination to provide more security (e.g., an Automated Teller Machine requires a card and a PIN).

Types of Electronic Authentication Techniques

Electronic identification technologies can be divided into two groups--biometrics and cryptography. Biometrics use physiological and behavioral characteristics to provide automated methods for personal identity verifications.[3] Cryptography is the process of communicating in or deciphering secret code.[4]

Biometrics

The basis of biometrics is using physiological and behavioral characteristics for automating personal identity verifications.[5] The six main types of biometrics commercially available are voice verification, signature dynamics, fingerprints, hand geometry, retina patterns, and keystroke dynamics.[6] Many organizations, including government agencies, are showing increased interest in using biometric technology to enhance information access control applications. For example, a bill introduced in January 1994 by Rep. Rick Lazio (R-N.Y.) would give the Department of Health and Human Services (HHS) six months to study the feasibility of using biometric techniques to verify welfare recipients' identities.

"State human-service providers in two New York counties and Los Angeles County have reported using an automated fingerprint matching system for fraud detection with impressive results:

- In Rockland and Onondaga Counties (N.Y.) from October 1992 to September 1993, government agencies saved $678,690 and closed about 15 percent of Home Relief case files; the state invested only $200,000 in purchasing and operating the systems.

- Similarly, Los Angeles County's General Relief program recovered $5.4 million of the AFIRM system's $9.6 million cost in the first ten months of operation."[7]

While possible IRS scenarios for each biometric method can be conceived, the IRS's use of biometrics would be difficult because of the size of the population we must deal with. To receive a significant number of paperless electronic returns, any biometric signature alternative must be available to a large, open population. A biometric system of that scale would be a challenge.

> "The biometric technologies mentioned above have already been used in a variety of small-scale niche market applications involving relatively small but "closed" populations, such as are characterized by one company's employees. The ultimate application population for any biometric, however, is exposure to the general public. No biometric yet has been successfully tried in such an "open" environment."[8]

Making biometrics an acceptable alternative to handwritten signatures for both the public and the IRS involves overcoming several constraints.

> "To be universally acceptable, biometrics must be legally and physically robust, safe to use, not invade the user's privacy, nor be perceived as socially unpalatable."[9]

For the near future, voice verification and signature dynamics seem the most promising for the IRS, considering their similarity to traditional ways of verifying information.

Basic Requirements for Return Filing

To accommodate individual[10] tax return filings an alternative signature approach must accommodate certain basic requirements. These include the following:

- Legislation and/or regulations must exist to allow legal, non-written signatures for tax returns.

- Every application must have a completed risk analysis as required under the Computer Security Act.[11]

- The application can not require a change to major IRS processes. Systems can be tested in a non-Tax Systems Modernization (TSM) environment but specifications must meet TSM requirements.

- No paper attachments can be required since the electronic signature must be linked to the data being signed. For example, employers use electronic signatures to authenticate Forms W-2.[12]

- IRS must treat electronic returns with electronic signatures with the same criteria as paper returns and signatures.

- New opportunities for filing fraudulent returns created by an alternative signature method must be addressed.

Voice Signatures with TeleFile

Voice verification is one of the most popular types of biometrics.[13] The IRS tested a variation[14] of this signature alternative for the first time during the 1993 and 1994 filing seasons. Taxpayers in southern Ohio who used TeleFile were allowed to voice sign their returns. When each taxpayer called TeleFile, he/she made a voice recording that served as the signature for the return. The signature consisted of the taxpayer's name and social security number. Over 69,000 taxpayers used this option in 1993 (72,000 in 1994). Cincinnati Service Center staff reviewed 11,000 of these voice signatures in 1993 and found that 99.1 percent were acceptable. A similar review in 1994 showed 99.4 percent acceptable.[15] Also, according to follow-up focus groups, taxpayers were very comfortable with voice signature.

The benefits of a voice alternative to a written signature on a tax return are: that taxpayers can file their returns from home; there is no cost to taxpayers; oral authentication of information is comfortable to most people, and it is relatively inexpensive for the IRS compared to other authentication techniques.

Some of the potential technical problems with voice verification are that a person's voice changes over time, and can be affected by mood and other factors. Also, the large numbers of utterances (10-20 matching words) required for accuracy and storage requirements for digitized voice are greater than for other biometrics methods.[16]

Digitized Signatures in Memphis

Digitizing signature devices allow a person's written signature to be stored electronically. The dynamics of a signature involve more than just the two-dimensional appearance of the signature. Signature dynamics verification includes characteristics such as: speed, pen pressure, etc.

> "(It) is argued that dynamic signature verification ... would be acceptable to people of all age and social groups so long as they are literate, since the signature is already a widely used form of personal identification."[17]

During the 1993 filing season, the IRS conducted a limited investigation of how digitized signatures could work within the Electronic Filing System. Written digitized signatures (which did not include signature dynamics) were captured using digitizing pen/tablet devices attached to personal computers and integrated with tax preparation software at the Memphis Service Center (MSC) in its Employee Filing Program. Paper signature documents were also collected. MSC collected 35 signatures during the 1993 test.

The benefits of digitized signatures and signature dynamics are that hand signing is a familiar way for the taxpayer to authenticate information. Under the current system, the cost of the biometrics input device needed for digitized signatures or signature dynamics would be born by the tax preparer. This technology is also popular in the business community. The United Parcel Service (UPS), for example, has been using a paperless system, including digitized signatures, to monitor the status of the 11.5 million packages it delivers daily.[18] The disadvantages are that the taxpayer must go to a third party to sign and transmit his/her return. (In the future, most personal computers may have tablets and electronic pens built in.) There are also some concerns about the security of the signatures at the preparer end of the process, since the electronic signatures could be used in other documents not authorized by the taxpayers.

Other Biometrics Technologies

Fingerprint technology, such as used by the Federal Bureau of Investigation (FBI), is one of the most common, and accurate, biometrics techniques. Widespread acceptance of fingerprints as a way of signing tax returns is unlikely, however, since the public perception of fingerprints has overtones of criminality.

Hand geometry and retina pattern scans are physiological techniques that deal with static, generally unchanging characteristics comparable to fingerprints. They tend to have lower false acceptance rates, but are much more expensive than behavior-based devices such as digitized signature. Scans would likely be less acceptable to the public as well.

Keystroke dynamics measure the way in which a computer user types at the keyboard and are more appropriate for access control than use in a public application.

Cryptography

Cryptography is communicating though enciphering and deciphering secret coded messages, typically known as keys. Cryptography authenticating electronic documents can be categorized as either private key or public key. A key is basically the same thing as a personal identification number (PIN). Private key cryptography uses a single key shared by two communicating parties. Public key cryptography makes use of two keys: a public key and a private key. The two keys are mathematically related, but the private key

cannot be detected from the public key. The IRS' Tax Systems Modernization security architecture will include cryptography.[19]

A certificate management authority verifies that a person is who they claim to be before certifying a public key. The IRS' Information Systems Development's (ISD) Security and Communications System (SEACOS) is a participant in a 1-year prototype with the U.S. Postal Service (USPS), in which the USPS will certify the person's public key. SEACOS will build a database of public keys.[20]

Some advantages of a cryptographic alternative to a handwritten signature are that the signature could be built into tax preparation software, digital signatures could be used to sign Forms W-2 and eliminate the need for the paper copy, and couples would be able to co-sign electronically.

The most common private key technology is a message authentication code (MAC). This involves a checksum formula that can be used to prove that the information in the message has not been altered after it is signed.

> "The sender uses a private algorithm, or formula, to create the MAC. The MAC, which might be something like 4AF3 OB62, is different for each message--customized [derived] by the combination of the formula and variables such as how many characters the message contains. "
>
> "When the message arrives, the receiver uses the same electronic key (formula) used by the sender to compute a MAC for the message. If the code (MAC) is different, she knows the message has been altered."[21]

One disadvantage of private key message authentication codes is that, by itself, it cannot prove to a third party that information actually originated from the sender.

> "Since both the sender of the information and the receiver of the information share the same key, it is possible that the information could have originated from either party."[22]

To address some limitations of private key MACs, the National Institute of Science and Technology (NIST) proposed government-wide standards in 1991 for electronic commerce, the Digital Signature Standard (DSS). The DSS uses a public key cryptographic system for generating and verifying digital signatures. A patent dispute between the government and the owner of most of the critical U.S. cryptographic patents is holding up the standard.[23] While an alternative public key system is used by many businesses, the lack of a standard is delaying government projects.[24]

> "In a public-private key system, if Sally sends a message, she can sign the document using a key that's only on her disk or on a smart card (an ATM-like card with digital memory). A receiver can verify the signature by getting Sally's public key from a source such as an electronic bulletin board, or perhaps the post office, if the government elects to have a role. Only the public key can verify if it was Sally's private key that created the string of letters and numbers in the signature."[25]
>
> "In addition, the verifier can provide the message, digital signature, and signer's public key as evidence to a third party that the message was, in fact, signed by the claimed signer. Given the evidence, the third party can also verify the signature."[26]
>
> "The digital signature is also becoming important in PC networks. ... software for electronic forms will feature digital-signature capability for things such as expense forms."[27]

The greatest disadvantage of a cryptographic solution would be the key management.

> "The difficulty with the system is making sure that receivers have been given the same key."[28]

Key management difficulties include verifying that the person who receives the key is who he/she says they are and replacing keys when taxpayers report they have lost theirs--a probable occurrence for a piece of data used only once a year in the case of individual return filings

Balancing Costs and Burden

Whatever alternative(s) to handwritten signatures the IRS chooses to pursue, it needs to balance costs between the IRS and taxpayers. Any alternative for which an individual must pay, or put forth some additional effort , is likely to be acceptable only to a limited population with a unique incentives such as those people who already use the Electronic

Filing System for a quicker refund. Conversely, techniques that are inexpensive and burden free have the potential for wide use.

Conclusion

Technology used for an alternative signature must be legally, forensically reliable and meet other minimal criteria that makes it resistant to fraud. Since the IRS is testing new ground in the area of tax administration, it will be setting precedence.

Research tests that evaluate public acceptance are very important. No alternative will succeed if it scares the average taxpayer, who may not be technologically educated. The alternative signature, therefore, must be a natural process for the taxpayer. It also must be reasonably burden-free and inexpensive. At the present, only voice signature and digitized handwritten signatures meet that criteria.

One possible solution for certain problems of a signature alternative would be for the IRS to share the costs of the signature alternative with another agency, such as the Social Security Administration, which provides a direct benefit (e.g., income payments) to a large population of taxpayers.

If the IRS is to find a successful alternative to handwritten signatures, multiple technologies in a variety of situations must be tested. Only in researching why some alternatives work and some do not will the IRS discover the best solutions for a paperless system.

Endnotes

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[7]"New Bill Calls for Study of Biometrics to Foil Welfare Cheats," **Security Technology News**, 2, March 25, 1994.

[8]Sherman, "Biometrics Futures."

[9]Sherman, "Biometrics Futures."

[10]While this paper discusses technologies that could be used for either individual or business tax returns, the issues it addresses are related primarily to individual returns.

[11]Weiss, Peter, Office of Management and Budget, telephone conversation, "Electronic Data Interchange: Selected Materials," May 14, 1993.

[12]Martin, February 1993 slides.

[13]NCR Corp., for example, recently announced it plans to roll out an ATM that uses voice recognition to allow cardholders access to their accounts. Voice verification is relatively inexpensive and comfortable to the user. The input device is usually a telephone, which reduces costs dramatically over other types of biometrics, and speaking into a telephone is not intimidating to the user.

[14]The TeleFile voice signature system does not verify the individual's voice. The signatures are recorded digitally. Later, tax examiners listen to a statistically valid sample of the recorded signatures. The voice signatures are stored for potential verification, if necessary.

[15]Letters were sent to the 111 taxpayers (0.9 percent) whose voice signatures were reviewed in 1993 and deemed unacceptable (70 in 1994). As of September 22, 1993, 86 of the 1993 taxpayers have responded with paper signatures. As of April 22, 1994, 66 of the 1994 taxpayers have responded with paper signatures.

[16]One procedural problem is the elimination of taxpayer-provided Forms W-2, which are currently an ingredient to fraud prevention.

[17]Sherman, "Biometrics Futures."

[18]Duffy, Caroline A., "UPS toes the line with its package-tracking technologies," **PC Week**, 10, June 28, 1993, p. 211.

[19]Design Master Plan, Internal Revenue Service, July 1994.

[20] Internal Revenue Service, Information System's Development, SEACOS slides faxed May 7, 1993.

[21]Bulkeley, **The Wall Street Journal**, June 7, 1993, p. B8.

[22]National Institute of Standards and Technology, "Digital Signature Standard," **CSL Bulletin**, January 1993, pp. 1-6.

[23]"Gore Urged to Push Electronic Plan Forward," **Information Law Alert: A Voorhees Report**, 2, March 25, 1994.

[24]Power, Kevin, "IRS Considers Using RSA Digital Signature," **Government Computer News**, 13, April 4, 1994, p. 1.

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Determining Worker Status and Its Effect on Federal Revenue

by Ken Beier and Cheryl A. Wagner

The classification of workers as employees or independent contractors requires judgment by IRS, giving the appearance of inconsistency and resulting in private industry pressure for a more definitive test. To address this issue, IRS' Artificial Intelligence Lab developed the SS-8 Determiner expert system which makes correct and consistent determinations of worker status. The system also produces personalized letters to the firm and worker informing them of the IRS' decision; enables lower-graded paraprofessionals to classify workers; reduces processing time; and boosts productivity. IRS plans to place the SS-8 Determiner software in the hands of taxpayers, thus helping them resolve worker status questions on their own. The effect of worker classification on federal tax revenue has also been a subject of controversy. To open new discussion, we examined two worker groups--emergency room physicians and truck drivers--for which reasonably good data are available. In these examples, we estimated federal tax revenue to be higher in an employer-employee relationship than in a client-independent contractor relationship. However, there may be other occupational groups for which this result would not hold. Therefore, conclusions on the overall tax revenue effects of worker status cannot be based on these two examples alone.

Introduction

Since the late 1960s, the reclassification of independent contractors to employees by the IRS has been the subject of considerable controversy and legislative activity. Reclassification frequently resulted in substantial assessments against employers for unwithheld income tax, and unpaid Federal Insurance Contribution Act (FICA) and Federal Unemployment Tax Act (FUTA) taxes. Faced with such assessments, many of these employers had no choice but to go out of business. Although subsequent legislation provided a safe haven to employers and limitations on assessments, the controversy of determining a worker's status remains.

In order to determine the applicability of tax and nontax rules under a wide range of legislation, it is necessary to know a worker's status as an "employee" or "independent contractor."[1] Employees are covered by the provisions of labor and social legislation, and state unemployment programs. Under the Internal Revenue Code, their employers must withhold income and FICA taxes, and pay FUTA and their share of FICA taxes. Also, employees have the right to continue their health care coverage under the Consolidated Omnibus Reconciliation Act (COBRA); are subject to the nondiscrimination provisions of the Employee Retirement Income Security Act of 1974 (ERISA); and are covered by provisions of the National Labor Relations Act, the Civil Rights Act of 1964, the Occupational Health and Safety Act, the Fair Labor Standards Act, and the Family and Medical Leave Act of 1993.

On the other hand, independent contractors are generally not covered by the above labor and social legislation; are not subject to withholding; and pay Self-Employment Contributions Act (SECA) taxes on their net self-employment earnings. Their employers (i.e., clients) do not withhold income taxes or pay FUTA or FICA taxes.

In addition to the issue of interpreting worker status (aka classification), much discussion involves the effect of misclassification on federal tax revenue. In congressional testimony and previous studies, IRS has often claimed that misclassification of employees as independent contractors leads to a loss of tax revenue to the federal government. Many comments from IRS compliance personnel also support this position. However, in its study of section 1706 of the Tax Reform Act of 1986, the Department of the Treasury stated that misclassification, overall, results in a revenue gain.

Another area of controversy surrounding worker classification has been the method used by the IRS to determine worker status. IRS classifiers use 20 points of common law, which have evolved through judicial precedent, to evaluate worker-firm relationships. These common law factors define areas in which a firm exercises the right to direct what is to be done by a worker and how it is to be accomplished. However, interpreting whether a worker-firm relationship meets the

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criteria defined in the 20 common law points requires judgment and varies among IRS classifiers. This has lead to a perception of inconsistency and accompanying pressure from industry groups for a more definitive test.

This article discusses these varied controversies. First, we describe an expert system, developed by IRS' Artificial Intelligence Lab, which addresses the inconsistencies of the current classification system. The system incorporates the experience of known employment tax experts to correctly and consistently classify workers and then issues a personalized letter to the worker and firm informing them of the IRS' determination. Second, we open new discussion on the effect of misclassification on federal tax revenue. Using compensation, employee benefits, and tax compliance data, this section develops examples of federal tax revenue for employees and independent contractors for two occupational groups—emergency room physicians and truck drivers.

A Short History of Legislation

IRS increased enforcement activity with regard to worker status in the late 1960s, reclassifying many independent contractors to employee status.[2] This led to substantial assessments against employers for their share of Social Security, Medicare, and Federal unemployment insurance taxes, and the unwithheld employee's share of Social Security, Medicare and income taxes. Concerns about IRS' actions led Congress to provide statutory relief to employers in the Revenue Act of 1978.

Section 530 of this Act prohibits the IRS from challenging an employer's treatment of an individual as an independent contractor for employment tax purposes if the employer has a reasonable basis for such treatment and consistently treats the individual, and any similar individuals, as independent contractors. Section 530 treats reliance on any one of the following as a reasonable basis for treating an individual as an independent contractor:

(1) judicial precedent, published rulings, technical advice with respect to the taxpayer, or a letter ruling to the taxpayer

(2) a past IRS audit of the taxpayer in which there was no assessment attributable to the employment tax treatment of individuals holding positions substantially similar to the position held by this individual

(3) long-standing recognized practice of a significant segment of the industry in which such individual was engaged

Section 530 was originally described as an interim measure to provide relief until Congress had time to address the complexities in this area. Instead, Section 530 was extended through a series of public laws, and made permanent in the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA). Section 3509 of TEFRA also placed limits on retroactive assessments on employers who were not entitled to relief under Section 530.

An exception to Section 530, for technical service workers who are retained under third party arrangements, was passed in Section 1706 of the Tax Reform Act of 1986 (TRA). Under this legislation, brokers who provide technical service workers to third parties (e.g., engineering firms) are governed by common law rules and not entitled to a safe haven for federal employment tax purposes.

In 1984, the SECA/FICA differential was eliminated (independent contractors paid lower SECA rates when compared to the combined FICA rate). The rates reached an equal level in tax year 1990.

Tax Treatment of Employees and Independent Contractors

As the previous section indicates, employment relationships and independent contractor relationships face different treatment under a wide range of legislation. To further demonstrate this idea, the tax treatment for workers and firms for tax year 1992 is summarized in Tables 1 and 2. In the employee case, the treatment of both the employer and the employee is shown in Table 1. In the independent contractor case, payments to independent contractors are fully deductible to the firm. Thus, the tax effects are shown only for the worker in Table 2.

For both income and social security taxes, the major differences in tax treatment are the deductibility of trade or business expenses and the treatment of fringe benefits. Independent contractors face fewer restrictions on their ability to deduct business expenses than employees whose employment-related expenses are deductible only for income tax purposes and only where they exceed 2 percent of adjusted gross income. Several types of fringe benefits, such as health and accident insurance, are not subject to FICA or income taxes for employees. They are also not deductible from Schedule C income. Thus, if a self-employed person purchases these items on their behalf, they are subject to SECA tax. Independent contractors are not subject to FUTA taxes, and are generally not eligible to receive any unemployment benefits.

Another major difference in tax treatment of employees is the manner in which social security and income taxes are collected. FICA taxes and income taxes on employees are collected mainly through the withholding system. Independent contractors are generally not subject to withholding and

Table 1
Tax Treatment of Employment Relationships
Tax Year 1992

Income/Expense Item	Employee Taxes		Employer Taxes	
	Income	FICA	Income	FICA/FUTA
	(1)	(2)	(3)	(4)
Wages	Taxable	Taxable(1)	Deductible	Taxable(2)
Trade or Business Expense	--	--	Deductible	--
Qualified Pension Benefits(3)	--	--	Deductible	--
Health and Accident Insurance	--	--	Deductible	--
Life Insurance	--	--	Deductible	--
Worker-Related Expenses	Deductible(4)	--	--	--
Individual Retirement Account	Deductible(5)	--	--	--

(1) The employee's share of the tax is withheld from their compensation at a rate of 7.65 percent on the first $55,000, and a rate of 1.45 percent on amounts over $55,000 and up to $130,200.
(2) The employer share of the FICA tax is equal to the employee share. In addition, the first $7,000 of wages is subject to a combined tax rate of 6.2 percent under the Federal Unemployment Tax Act (FUTA). Under the integrated Federal/State system, part of the tax is paid to the state of employment and part is paid to the federal government.
(3) Some non-qualified plans are also exempt from income and FICA taxes for the employee.
(4) Deductible for those who file Schedule A to the extent that expenses exceed 2 percent of adjusted gross income.
(5) Deductible up to $2,000 for individuals not covered by a retirement plan, and some who are covered depending on their level of income.

make payments through the estimated tax system. Clients must report compensation paid to independent contractors annually on Form 1099-MISC.

Table 2
Tax Treatment of Independent Contractors
Tax Year 1992

Income/Expense Item	Income Tax	SECA Taxes
	(1)	(2)
Net Self-Employment Income	Taxable	Taxable(1)
Trade or Business Expenses	Deductible	Deductible
Qualified Pension Benefits(2)	Not Applicable	Not deductible
Health Insurance	Deductible(3)	Not deductible
Accident Insurance	--	Not deductible
SECA TAX	Deductible(4)	--
Keogh/Self-Employment Plan	Deductible(5)	--

(1) The SECA tax base is defined as 93.5 percent of net self-employment income The rate is 15.3 percent on the first $55,000, and 2.9 percent on amounts over $55,000 and up to $130,200.
(2) Contributions to qualified pension plans, KEOGH or self-employment plans are not deductible in defining net self-employment income; thus they are subject to SECA tax. However, self-employed persons can establish a profit sharing plan (Keogh or self-employment plan) on their own behalf which is deductible for income tax purposes.
(3) One-fourth of self-employment health insurance payments are deductible for income tax purposes. For tax year 1992, one-fourth of all payments made before July 1 were deductible. Since the full-year deduction was allowed in 1993 and 1994, it is used in the examples of worker tax treatment presented here.
(4) One-half of SECA tax is deductible for income tax purposes.
(5) Contributions for a self-employed individual or partner are deductible for income tax purposes.

An exception to the above requirements applies to employers who have a safe haven under section 530. In this situation, there is no requirement for withholding and payment of social security taxes and federal income taxes. Even though the worker receives a Form 1099-MISC, she is still an employee and is liable for her share of FICA taxes. However, in practice, most workers in this situation report their compensation as self-employment income and pay SECA taxes.

This review of tax treatment of employees and independent contractors indicates that some factors, such as non-taxable fringe benefits favor employees, while the ability to deduct employment-related expenses favors independent contractors. Where workers fall under the estimated tax payment system rather than the withholding system, there is a greater occurrence of payment problems and the potential for the underreporting of income and overreporting of expenses.

How IRS Classifies Workers

It is important that the IRS consistently and correctly determine worker status given the different tax treatment of employees and independent contractors. Currently, a worker may voluntarily request a ruling from the IRS about her status using Form SS-8, *Determination of Employee Work Status for Purposes of Federal Employment Taxes and Income Tax Withholding*. IRS classifiers request a corresponding Form SS-8 from the firm where the individual works, so that both the firm and worker positions can be considered before determining the status. Difficult cases which may become precedent-setting are forwarded to IRS Chief Counsel for processing.

IRS classifiers evaluate a worker's status using 20 common law factors (see the Appendix for a complete list). These points of law evolved through judicial precedent from the concept of master-slave defined in English law. Treasury regulations issued in 1936 referenced common law standards

for the classification of a worker as an employee. However, the lower courts continued to apply a variety of standards. In 1947, the Supreme Court issued a pair of opinions which applied an "economic reality" test. In this test, an individual is an employee if she is dependent on the firm where she works, as a matter of economic reality. Congress reacted by passing the Gearhart resolution which endorsed the use of common law tests. Current Treasury regulations include common law tests and state that a legal relationship of employer-employee exists between a firm and worker if the firm has the right to control and direct the individual in what is to be done and how it is to be accomplished.[3]

Interpreting whether a worker-firm relationship meets the criteria defined in the 20 common law factors requires judgment and varies among classifiers. This variation has lead to perceptions of inconsistency and resulted in pressure from private industry for a more definitive test. In addition, Forms SS-8 are processed by a small number of specialists in each IRS district office and require 4-6 hours per case for processing. The number of these forms filed annually has increased from 1,000 in the 1980s to 15,000 currently. With this increase, many districts have developed backlogs, frustrating both taxpayers who requested rulings as well as IRS staff responsible for the work.

The SS-8 Determiner Expert System

To solve the above problems, the IRS' Artificial Intelligence Lab developed the "SS-8 Determiner." The SS-8 Determiner is an expert system which makes correct and consistent worker classifications, generates personalized and well-written letter rulings to the firm and worker, and processes Forms SS-8 more timely.

The SS-8 Determiner was written for use on any "386" or better personal computer running DOS. It has a series of screens which prompt the user for input and display the system's conclusions. These screens are graphically-oriented and can be used with or without a mouse. The screens represent the information on the Form SS-8.

The system's determination process is modeled after the process IRS classification experts use to determine a worker's status. Based on the worker's and firm's Form SS-8 responses, the experts accumulate evidence in their minds supporting an independent contractor or employee determination. They group the evidence under the 20 common law factors, with some factors weighted more heavily than others.

The SS-8 Determiner evaluates the evidence through the use of scores. These are cumulative numbers which increase whenever a Form SS-8 response supports a particular status. Each Form SS-8 has a total of 40 scores: 20 employee common law factor scores and 20 independent contractor common law factor scores. For every Form SS-8, the 20 employee scores are totaled and compared to the 20 totaled independent contractor scores. The highest score determines the classification (with some mitigating factors thrown in).

The SS-8 Determiner contains approximately 200 rules which if "true" increment the scores. A typical rule would read, "If the worker works more than 8 hours a day for the firm, increment the 'Hours of Work' employee score." Rules are categorized as either employee or independent contractor. However, a rule can affect more than one common law factor. This may sound confusing at first, but based on our knowledge acquisition sessions with the classification experts, it was determined that information such as whether a worker is "instructed" by the firm, can have a bearing on the "Instructions" common law factor as well as the "Training" common law factor.

Also, each common law factor has a contractor and employee score and a list of rules which can affect those scores. Weights were assigned to the rules and factors based on how much importance our field experts assigned to a particular rule or factor when classifying a worker.

When making a determination for a Form SS-8, the system sums the independent contractor and employee scores for all 20 common law factors. The larger score determines the worker's status. The same principle applies to determining the case, consisting of a worker's and firm's Forms SS-8. However, the system will report "undetermined" and request a manual review if any of the following conditions exist:

- too large a difference between the firm and worker's Forms SS-8 (meaning they disagree on many issues)
- too little information to make an effective recommendation
- too little difference between the independent contractor and employee scores or
- statutory or audit issues

In the end, the system generates final reports and letters to the firm and worker. The reports summarize the scores and group rule explanations under appropriate categories to give the user a thorough understanding of why the system came to a particular conclusion. The letters to the firm and worker inform each of the worker's status as either an independent contractor or employee. These letters require the most time and effort when performed by IRS personnel. The letters must reflect the worker's situation using the appropriate pronouns and verbs, as well as the correspondence format of the particular IRS district office.

We designed the letter generation portion of the system using "boiler plate" text files mixed in with individualized paragraphs which mention particulars of the work situation. Users have the option of changing the "boiler plate" paragraphs by editing text files read by the SS-8 Determiner. Also, users may tailor the letter to their district's particular correspondence format by editing a "letter option" file to indicate a preference for things such as the current date and case number specified in the letter heading.

The individualized sections of the letters report the six common law factors which contributed most heavily to the final determination, as well as an explanation of these common law factors. For example, if the common law factor "Training" had the most compelling difference between its independent contractor and employee scores, it would be mentioned first in this section of the letter. A general description of the "Training" common law factor would be followed by the information reported by the worker and firm on the Form SS-8. Other individualized sections are generated if various statutory conditions are met and the taxpayer needs to be informed of his rights and responsibilities.

Effectiveness and Benefits of the SS-8 Determiner

In order to verify that the SS-8 Determiner made correct determinations, three field tests were conducted at IRS' Austin Compliance Center (AUCC). The first, in January 1990, used 226 cases from the IRS San Antonio District inventory of cases. The test was divided into two parts: (1) having eight experts classify 25 cases and discuss their classification methods; and (2) having at least one expert classify the remaining 201 cases. The computer agreed with the expert determinations (excluding those cases which the computer recommended for human review) in 98.5% of the cases. The second test was conducted in February through May 1993 and consisted of 281 cases from the AUCC Correspondence Examination inventory. In this test, the system agreed with the expert determination in 97.5% of the cases. The third test was conducted in June through October 1993 and consisted of 200 cases from the San Antonio inventory. For this test, each case was classified by the SS-8 Determiner, an SS-8 Tax Examiner, and a Revenue Agent. The results of this test are still being tabulated.

The SS-8 Determiner has been deployed in five of IRS' seven regions with plans for full deployment by the end of 1994. Based on early results at AUCC (where it is being used to process all of Southwest Region's Forms SS-8), we can report the following benefits of system use:

- The SS-8 Determiner reduced processing time by 1 hour per case, thus boosting productivity more than 25 percent.
- Lower-graded paraprofessionals made determinations, at less than half the salary cost of the classifiers (typically Revenue Agents) who previously processed Forms SS-8.
- Revenue Agents were freed to do other examination work rather than classifying Forms SS-8, generating substantial additional tax revenue.
- Taxpayers received consistent, well-written letters in which the basic format has been reviewed by IRS Chief Counsel.

These benefits indicate that the SS-8 Determiner can reduce the amount of IRS resources devoted to the task of worker classification while simultaneously eliminating the public's perceptions of inconsistent determinations by the IRS. In addition, future IRS plans are to place the SS-8 Determiner software in the hands of workers and firms to make their own determinations, further reducing the burden on workers, firms and the IRS.

Revenue Consequences of Misclassification

Concerns about the tax revenue consequences of worker classification have generated considerable comment on the tax treatment of independent contractors since the 1970s. In testimony to the Subcommittee on Select Revenue Measures of the House Ways and Means Committee in 1979, Assistant Secretary of the Treasury (Tax Policy) Don Lubick stated that "substantial numbers of so-called independent contractors do not pay their fair share of tax each year because they fail to report the full amount of their income."[4] Mr. Lubick also stated that the revenue loss from this noncompliance was conservatively estimated at $1 billion per year.

In a 1989 hearing before a subcommittee of the House Committee on Government Operations, Acting IRS Commissioner Michael Murphy cited the difficulties with the definition of "employee" under the common law rules and compliance problems related to the misclassification of workers.[5] He provided estimates that over $1 billion in individual income, FICA, and FUTA revenue are lost annually as a result of misclassification.

Concerns about the effects of Section 1706 on employment in the technical services area prompted Congress, as part of the Technical and Miscellaneous Revenue Act of 1988 (TAMRA), to request a study of this legislation by the

Department of the Treasury. This study,[6] which reviewed the tax treatment of employees and independent contractors, cited the underreporting of income by independent contractors and their favorable treatment regarding trade or business deductions. It also discussed the role of tax-favored employee fringe benefits in compensation of employees. Based on a series of examples of tax treatment, the report concluded the misclassification of employees as independent contractors, actually increases federal tax revenue. This conclusion was driven largely by the role of nontaxable fringe benefits for employees.

On the surface, the conclusions of the 1706 report are contradictory to previous IRS studies and testimony. The report also is contrary to the experience of many IRS enforcement personnel. IRS personnel generally believe that firms treat their workers as independent contractors to save the costs of overhead, benefits and taxes associated with employees. They also believe that many workers prefer independent contractor status in order to take advantage of Schedule C deductions or avoid paying taxes. Some IRS enforcement personnel also believe that workers and businesses collude in this arrangement; the firm avoids employment-related costs, and the worker avoids withholding and, oftentimes, filing altogether.

The actual revenue consequences of misclassification depend on two factors—the worker's compensation package and the worker's tax compliance characteristics. For example, in some situations independent contractors may be paid as much or more than the total compensation (money salary plus employer-paid taxes and benefits) of employees. However in others, firms take advantage of independent contractors and pay them less than employees who perform similar work. This use of independent contractors can be viewed as one of several means, along with use of leased, part-time, or temporary employees, to reduce labor costs.

This article presents new examples of the federal tax effects of misclassification which consider both of the above two factors. The purpose of the examples is to examine compensation patterns and compliance for two occupational groups where there have been controversies involving worker classification—emergency room physicians and truck drivers. By using compensation data from industry surveys and realistic employee benefits and tax compliance estimates for particular groups, a reasonable picture of net compensation and the resulting pattern of federal tax revenue can be developed for these situations. While these examples do not conclusively define the revenue effects of misclassification or clarify the discrepancies of the various studies in this area, they do give us a fairly realistic picture for the groups addressed here.[8]

Tables 3 and 4 present the compensation and related tax payments for a $1000 payment to an employee and a payment for comparable services made to an independent contractor. The relative size of the payment to the independent contractor is based on survey data for compensation to employees and independent contractors for the particular occupation. The worker expense data used in these examples is based on Schedule C expense patterns for independent contractors in industry groups that correspond to these occupations.[7] For employees, it is assumed that there are no unreimbursed employee expenses in excess of 2 percent of adjusted gross income. The tax and statutory payment section in the tables uses the rules in effect for tax year 1992.

Emergency Room Physicians

Compensation data for emergency room physicians and discussions with IRS personnel familiar with the tax treatment of hospital staff indicate that hospitals use a variety of arrangements to acquire the services of emergency room staff. Most physicians are paid a fixed salary.[9] However, many physicians are paid a percentage of fees charged by the hospital. Sometimes a minimum payment applies to this arrangement. A third situation is where the hospital hires an outside firm to manage the emergency room. A variation on the third situation is where the hospital hires a group of physicians to staff an emergency room on a 24-hour basis.

In the first and the third situations, most of the salaried physicians are common law employees of the hospital or the firm/group managing the emergency room. However, it is possible that some part-time physicians who have a full-time office outside of the hospital could be independent contractors under common law rules. Payment as a percentage of hospital fees, by itself, does not make physicians independent contractors. Thus, for the physicians in the second group, an examination of their relationship with the hospital would be required to determine if they were employees or independent contractors.

We constructed two scenarios in which a hospital acquired the services of emergency room physicians. The employment tax status of the physicians in these examples was determined using the SS-8 Determiner expert system. The first example involved a physician who was not trained, instructed, or supervised by the hospital; who did not advertise her services to the general public; who did not invest in any equipment or supplies nor maintain an office; who was paid in the form of an hourly wage; and who devoted 75 percent of her working hours to performing services for the hospital. This individual's status was clearly determined to be an employee. The second individual was not trained, instructed or supervised by the hospital; did advertise her services to the general public; did not invest in equipment or supplies while performing for this hospital but maintained a private office costing $100,000; was paid as a percentage of hospital fees; and devoted 25 percent of her working hours to

performing services for this hospital. This individual's status was determined to be an independent contractor. The most compelling factors in the second case, were the investment in a private office, the offering of her services to the public, the performance of services for other hospitals, and the method of payment.

The compensation and tax revenue for an employee versus an independent contractor emergency room physician are shown in Table 3. The money salary in item 1 for salaried employees and independent contractors is based on 1992 data from a survey of compensation of hospital-based physicians.[10] The employee benefits estimates used here are taken from a Bureau of Labor Statistics establishment survey,[11] and the KEOGH and self-employment expenses for independent contractors are estimated from Schedule C expense data for independent contractor physicians.[12]

The net compensation for independent contractors in item 7 is that remaining after payment of typical expenses of approximately $400.[13] As with most wage earners, compliance of employee physicians in reporting wages is approximately 100 percent. Compliance for independent contractor physicians is estimated to be 93.7 percent.[14] This figure has been applied to net compensation for independent contractors to compute the taxes paid in items 10 through 14.

Total outlays by the employer, which include total compensation (item 5) and employer-paid taxes (item 15), are $235 higher to independent contractors than that to employees. Thus, profits for the hospital would be reduced by this amount. This is shown in item 8 and the federal income tax offset for these reduced profits is shown in item 18. The net compensation of workers, less taxes (item 16) is $712 for employees and $643 for independent contractors. The total federal tax revenue in item 17 indicates a higher figure from employees ($412) than from independent contractors ($292). State income tax (item 11) has been deducted from worker compensation in calculating federal income taxes. This reflects the situation of a taxpayer who files a Schedule A and itemizes her deductions. FUTA revenue has not been included in federal tax revenue in item 17.[15]

Table 3
Federal Tax Revenue Comparison for Emergency Room Physicians

Item #	Item	Employer/Employee			Independent Contractor		
		Employer	Employee	Combined	Client	Worker	Combined
		(1)	(2)	(3)	(4)	(5)	(6)
1	Money Salary [1]		$1,000			$1,463	
	Voluntary Fringe Benefits						
2	Retirement/Keogh	$82				$89	
3	Health Insurance Premium	$40				$4	
4	Total	$122				$93	
5	Total Compensation (Item 1 + 4)		$1,122			$1,463	
6	Deductible Worker Expenses		$0			$400	
7	Net Compensation (Item 5 - 6)		$1,122			$1,063	
8	Amount Retained by Client [2]				($235)		
9	Worker Compliance Rate		100.0%			93.7%	
	Taxes and Statutory Payments						
10	Federal Income Tax [3]		$259	$259		$217	$217
11	State Income Tax [4]		$75	$75		$63	$63
12	Social Security (FICA/SECA) [5]	$77	$77	$153		$141	$141
13	Unemployment (FUTA + State) [6]	$20		$20			
14	Workers' Compensation [7]	$10		$10			
15	Total	$107	$411	$517		$420	$420
16	Net To Worker, Less Taxes (Item 7 - 15)		$712			$643	
17	Net to Federal Government (Item 10 + 12 + 18)	$77	$336	$412	($66)	$357	$292
18	Tax Offset to Item 5 [3]				($66)		

[1] Includes regular time and holiday/vacation/sick pay.
[2] This represents the difference in total outlays by the employer for an employee/employer relationship versus an independent contractor relationship.
[3] Federal Income Tax Rate for Employee, Independent Contractor, and Client is estimated at 28%.
[4] State Income Tax Rate for Employee and Independent Contractor is 7.5%.
[5] Self-employed persons pay the combined rate of 15.3% * 92.35% = 14.12955% on net income up to $55,000.
[6] Unemployment taxes are estimated at 2% of wages.
[7] Workers compensation is estimated at 1% of wages.

Note: Detail may not add due to rounding.

If the employer were a nonprofit hospital, then there would be no income tax offset. However, federal tax revenue from the employee case ($412) would still be higher than the independent contractor case ($357). Despite the higher level of compensation of independent contractor physicians, federal tax revenue appears to be lower for this group.

Truck Drivers

Truck drivers who operate a company-owned vehicle and receive a salary are clearly employees under common law rules, regardless of whether their compensation is reported as wages on a Form W-2 or payments for services on a Form 1099. Other drivers who own their own truck, have a large number of clients, and can incur a profit or loss are clearly independent contractors.

The compensation and tax situation for employee versus independent contractor truck drivers are presented in Table 4. Data from an annual survey of truck drivers—both company drivers and independent drivers—indicate that the wages of company drivers are approximately 10 percent higher than the net earnings of independent drivers.[16] Since net compensation is provided by the survey data and serves as the SECA and income tax base, it is not necessary to include a separate estimate of worker expenses in this example. Gross compensation to independent truck drivers, which covers fuel, vehicle-related and other costs, would be substantially higher than the net compensation figure presented here. The level of KEOGH and health insurance expenses for independent drivers is estimated from income tax data.[17]

In the truck driver example, total outlays by the employer for employee drivers ($1163 + $107) are substantially higher than that for owner drivers ($914). The difference ($356) is retained by the client in item 8. This increase in profits, in turn has a federal income tax effect ($100), which is shown in item 18. The compliance rate for net self-employment income (66.7 percent) of independent contractor drivers[19] substantially lowers the amount of SECA and income taxes. Total federal taxes paid for the employment relationship is estimated to be $412 versus $330 for the independent contractor

Table 4
Federal Tax Revenue Comparison for Truck Drivers

Item #	Item	Employer/Employee			Independent Contractor		
		Employer	Employee	Combined	Client	Worker	Combined
		(1)	(2)	(3)	(4)	(5)	(6)
1	Money Salary [1]		$1,000			$914	$914
	Voluntary Fringe Benefits						
2	Retirement/Keogh	$54				$5	
3	Health Insurance Premium	$109				$16	
4	Total	$163				$21	
5	Total Compensation (Item 1 + 4)		$1,163			$914	$914
6	Deductible Worker Expenses		$0			$0	$0
7	Net Compensation (Item 5 - 6)		$1,163			$914	$914
8	Amount Retained by Client [2]				$356		
9	Worker Compliance Rate		100.0%			66.7%	
	Taxes and Statutory Payments						
10	Federal Income Tax [3]		$259	$259		$144	$144
11	State Income Tax [4]		$75	$75		$42	$42
12	Social Security (FICA/SECA) [5]	$77	$77	$153		$86	$86
13	Unemployment (FUTA + State) [6]	$20		$20			
14	Workers' Compensation [7]	$10		$10			
15	Total	$107	$411	$517		$272	$272
16	Net To Worker, Less Taxes (Item 7 - 15)		$753			$642	
17	Net to Federal Government (Item 10 + 12 + 18)	$77	$336	$412	$100	$231	$330
18	Tax Offset to Item 5 [3]				$100		

[1] Includes regular time and holiday/vacation/sick pay.
[2] This represents the difference in total outlays by the employer for an employer/employee relationship versus an independent contractor relationship.
[3] Federal Income Tax Rate for Employee, Independent Contractor, and Client is estimated at 28%.
[4] State Income Tax Rate for Employee and Independent Contractor is 7.5%.
[5] Self-employed persons pay the combined rate of 15.3% * 92.35% = 14.12955% on net income up to $55,000.
[6] Unemployment taxes are estimated at 2% of wages.
[7] Workers compensation is estimated at 1% of wages.

Note: Detail may not add due to rounding.

relationship. The net compensation less taxes (item 16) is higher for employee drivers ($753) than for independent drivers ($642). This gap is much smaller than that for their net compensation on item 7. Thus, due to noncompliance, independent drivers are able to partially offset their lower net compensation.

A separate scenario was run for truck drivers with compliance at 90 percent for independent contractors. This increased worker federal taxes from $231 to $312 and combined federal taxes from $330 to $411—almost equal to the $412 for the employment relationship. This demonstrates the major role of compliance in affecting revenues from independent truck drivers.

The examples in this section indicate a higher level of federal tax revenue for employer-employee relationships relative to client-independent contractor relationships. Even with substantially higher compliance (90 percent), federal tax revenue from owner-operator truck drivers would be about the same as from those in an employment relationship. While we cannot draw conclusions based on a small number of examples, those presented here indicate lower revenue when emergency room physicians and truck drivers are treated as independent contractors.

The compliance parameters presented here apply to filers of income tax returns. As previously mentioned, many independent contractors can more easily avoid filing income tax returns compared to an employee situation. Thus, the federal tax revenue from the typical independent contractor arrangement may be less than that stated here.

Conclusion

Despite over 20 years of controversy, the determination of worker status remains dependent on judgment. Whether a worker is an employee is still determined using 20 common law factors, which are difficult and time-consuming to interpret.

For the examples presented in this article, federal tax revenue from independent contractors appear to be lower than that for employees. In the emergency room physician example, a high level of expenses and KEOGH deductions reduced federal tax revenue for independent contractors below that for employees. For truck drivers, lower initial compensation and low tax compliance for independent contractors contribute to lower revenue relative to employees. Still, for some independent contractor groups—especially those with a low level of expenses and high tax compliance—it is possible that federal tax revenue is higher than it is for employees. Thus, conclusions on the overall tax revenue effects of worker status cannot be based on the two examples presented in this article.

Given that classification of workers as employees may or may not result in additional federal tax revenue, the IRS is presented with the dilemma of what level of resources to devote to this task. The SS-8 Determiner expert system provides at least a partial solution to this problem, as it makes correct, consistent, well-written determinations and communicates them to taxpayers in a personalized letter. Additionally, classifications using this software can be performed by lower-graded employees in less time than the traditional approach.

The IRS Strategic Business Plan/Compliance 2000 strategy calls for assisting taxpayers in voluntarily meeting their tax obligations. One step toward this goal are future IRS plans allowing workers and firms to make their own determinations using the SS-8 Determiner software. Firms would get instant feedback about the proper handling of employment tax, withholding and benefits for their workers. Workers would know immediately if they were covered by employee benefits and unemployment insurance. Finally, the IRS would be relieved of a resource intensive task that frequently results in large district caseloads.

Appendix

The following are the 20 common law factors used to determine employee status. Workers are generally considered employees for Federal tax purposes if they:

1. Must comply with employer's instructions about the work
2. Receive training from or at the direction of the employer
3. Provide services that are integrated into the business
4. Provide services that must be rendered personally
5. Hire, supervise, and pay assistants for the employer
6. Have a continuing working relationship with the employer
7. Must follow set hours of work
8. Work full-time for an employer
9. Do their work on the employer's premises
10. Must do their work in a sequence set by the employer
11. Must submit regular reports to the employer
12. Receive payments of regular amounts at set intervals
13. Receive payments for business and/or traveling expenses
14. Rely on the employer to furnish tools and materials
15. Lack a major investment in facilities used to perform the service

16. Cannot make a profit or suffer a loss from their services
17. Work for one employer at a time
18. Do not offer their services to the general public
19. Can be fired by the employer
20. May quit work at any time without incurring liability

Source: Exhibit 4640-1, Internal Revenue Manual 4600 (Employment Tax Procedures), and Rev. Rul. 87-41, 1987-1 C.B. 296.

Endnotes

[1]The term independent contractor is used here to describe how the client or recipient of services is treating the worker. If the worker is paid as an independent contractor and receives a Form 1099-MISC then she is, most likely, reporting these payments as self-employment income and is identified as an independent contractors. This does not mean that these workers would all be considered independent contractors under common law rules.

[2]For a more complete history of employment tax controversies and legislation, see "Taxation of Technical Services Personnel: Section 1706 of the Tax Reform Act of 1986, A Report to Congress," Department of the Treasury, March 1991.

[3]Congress and the courts have established certain situations in which by statute, an individual is classified as an employee or a non-employee and the common law tests are overridden. However, these comprise a small number of occupations (e.g., real estate agent and direct seller) and generally the 20 common law factors apply.

[4]Hearings Before the Subcommittee on Select Revenue Measures of the House Ways and Means Committee, 96th Con., 1st Sess. (June 20, 1979) Statement of Donald C. Lubick, Assistant Secretary of the Treasury (Tax Policy).

[5]Hearings Before the Subcommittee on Commerce, Consumer, and Monetary Affairs of the House Committee on Government Operations. (May 16, 1989). For a discussion of these issues, see "Tax Administration Problems Involving Independent Contractors, Twenty-Sixth Report by the Committee on Government Operations, House Report 101-979," November 9, 1990.

[6]See "Taxation of Technical Services Personnel: Section 1706 of the Tax Reform Act of 1986."

[7]Since many taxpayers have both wage income and self-employment (i.e., Schedule C) income, worker status is not readily apparent from tax return data. For the analysis in this article, employees were defined as those whose wage income is over $10,000 and whose wage income exceeds self-employment income. Independent contractors were those who did not fit in the employee definition, had over $10,000 in Schedule C net income, and paid less than $5,000 in wages. Using these definitions, data from the 1991 Statistics of Income individual sample indicated that 58.4 percent of Forms 1040, 1040A, and 1040EZ were employees; 8.8 percent were independent contractors; and the remainder were sole proprietors (with employees) or all others not fitting these descriptions. Using these definitions, data from the 1988 Taxpayer Compliance Measurement Program sample indicated that 57.5 percent were employees; 14.5 percent were independent contractors; and the remainder were sole proprietors (with employees) or others not fitting these descriptions.

[8]A revenue estimate should be based on representative individual-level data that contains all the relevant compensation and tax parameters. In contrast, this approach uses the mean value of compensation and tax-related variables from a variety of sources.

[9]Data from a recent survey of hospitals indicated the type and level of payments to emergency room physicians. See "1992 Physician Salary Survey Report—Hospital-Based and Group Practice," Hospital Compensation Service, John R. Zabka Associates, Inc., Oakland, New Jersey. The 1992 survey covers 121 emergency room physicians in 27 hospitals across the country. Also, discussion with staff in the IRS Arkansas District Office.

[10]The ratio of money salary for independent contractors to employees was taken from compensation data for emergency room physicians in Zabka Associates, "1992 Physician Salary Survey Report." The ratio used here is the average salary per hour for 25 contract physicians divided by the average salary per hour for 96 employee physicians. Since this survey indicated more widespread use of independent contractors in emergency rooms than in other medical specialties, this group was selected as an example.

[11]For employees, the rate of benefit costs to wage costs for broad occupational groups are from a March 1992 establishment survey. See "Employment Cost Indexes and Levels, 1975-93," U.S. Department of Labor, Bureau of Labor Statistics, September 1993, Bulletin 2434. For physicians, data for professional specialties and technical employees was used that indicate insurance costs at 8.2 percent of wages and retirement costs at 4.0 percent of wages.

[12]For independent contractor physicians, the rate of KEOGH ($60.59) and health insurance ($3.05) expenses per $1000 in gross income from the 1991 Statistics of Income

individual sample have been used. For the 408 independent contractor physicians, 186 had self-employment health insurance deductions and 212 had KEOGH deductions. The expense rate used here is a weighted mean for all independent contractor physicians regardless of whether they took deductions for KEOGH and health insurance payments.

[13]For independent contractors, the ratio of Schedule C expenses to Schedule C gross income from the 1991 Statistics of Income individual file has been used. For physicians, this is 27.4 percent of gross income.

[14]The compliance rate used here is a weighted mean for reporting of Schedule C net income for 88 independent contractor physicians in the 1988 TCMP sample. The 93.7 percent compliance rate is substantially higher than the 75.9 percent compliance rate for all independent contractors in the TCMP sample.

[15]If a firm classifies the worker as an independent contractor, there is a decline in FUTA revenue, but there is a corresponding elimination of eligibility for unemployment benefits. While an individual worker may be worse off because she is not covered, the unemployment system is not necessarily worse off because someone is treated as an independent contractor. Given this, unemployment taxes have not been included in total federal tax revenue (item 17).

[16]Net compensation of independent drivers has been found to be slightly lower than wage payments to company drivers. See "Driver's Opinion Survey, Summary of Results Survey VIII (1988) - XIII (1993)," Road King Magazine, Park Forest, Illinois. This is an annual mail-back, postage-paid survey contained in Road King magazine, with approximately 5700 annual respondents. The proportion of drivers who are employees has increased from 46 percent in the 1988 survey to 66.5 percent in the 1993 survey. The following data were reported from the survey:

	Miles Driven		Compensation Per Mile	
Year	Employees	Independents	Wages	Net Compensation
	(1)	(2)	(3)	(4)
1988	95,400	96,400	$0.258	$0.216
1989	92,906	94,116	$0.250	$0.255
1990	97,146	97,330	$0.236	$0.233
1991	100,360	100,240	$0.258	$0.214
1992	100,410	100,130	$0.269	$0.241
1993	100,090	100,100	$0.298	$0.273

The mean of the ratio of independent contractor earnings relative to wages over the 1988-1993 period (.914) has been used in Table 4.

[17]For independent contractor truck drivers, the rate of KEOGH ($5.72) and health insurance ($17.53) expenses per $1000 in gross income from the 1991 Statistics of Income individual sample have been used. For the 445 independent contractor drivers, 106 had self-employment health insurance deductions and 17 had KEOGH deductions. The rate of expenses used here is a weighted mean for all independent contractor truck drivers regardless of whether they took deductions for KEOGH and health insurance payments.

[18]For employees, the rate of benefit costs to wage costs for broad occupational groups are from a March 1992 establishment survey. See "Employment Cost Indexes and Levels, 1975-93, U.S. Department of Labor, Bureau of Labor Statistics, September 1993, Bulletin 2434. For truck drivers, data for transportation and public utility occupations was used that indicate insurance costs at 10.9 percent of wages and retirement costs at 5.4 percent of wages.

[19]The compliance rate used here is a weighted mean for reporting of Schedule C net income for 338 independent contractor truck drivers in the 1988 TCMP sample. The 66.7 percent compliance rate is lower than the 75.9 percent compliance rate for all independent contractors in the TCMP sample.

A Guide to Government Economic and Demographic Data

by Bonnie L. Nichols

IRS programs involving taxpayer education and outreach, and long-range planning have often had need for common government economic and demographic data. With the advent of IRS' National Office Research and Analysis (NORA) concept and its District Office Research and Analysis (DORA) counterparts, the Service's need to obtain such data is increasing. This article discusses uses and sources of government data at the subnational level and provides a list of references useful for obtaining such data. In addition, privacy issues are discussed as IRS users of government data have a distinct responsibility to avoid even the appearance of data misuse.

Introduction

Thou shalt not sit
With statisticians nor commit
A social science.

Wystan Hugh Auden

Despite Auden's commandment, the social sciences and statisticians flourish in the U.S. Federal Government. A casual stroll through the Government Printing Office reveals thousands of statistical periodicals, pamphlets, and reports on every conceivable subject. As both producer and promoter of these items, the Federal Government is clearly a statistical sinner in the eye's of Auden. IRS' own participation has included the use of non-IRS government data on common economic and demographic characteristics in efforts to target public information campaigns and make long-range plans of various types. With the advent of IRS' National Office Research and Analysis (NORA) concept and its District Office Research and Analysis (DORA) affiliates, the IRS will "commit further social sciences" as it uses and generates an abundance of statistics on market segments and taxpayer compliance.

Often referred to as the life-blood of social scientists, data are essential to IRS endeavors such as NORA/DORA. Unfortunately, obtaining these needed data, particularly government data, can be frustrating. Beginning the search for data, an IRS researcher need only anticipate vast bureaucracies and intimidating librarians before entertaining the thought of pursuing a new, less cumbersome occupation. However, obtaining government data is a workable project. In the sections below, I hope to make this task a little easier by discussing sources of government data and how to obtain them.

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The following sections of this article introduce sources of subnational economic and demographic data available from government agencies, including the Decennial Census of Population and Housing and the Economic Censuses.[1] The data to be discussed are "generic" in that they reflect summations of common economic and demographic characteristics, not individual person-by-person records. In addition, the issue of privacy and the special responsibilities that IRS users of government data have are also discussed. Finally, the appendix to this article was designed as a source reference and lists contacts and telephone numbers useful when attempting to obtain government data.

What Is Economic and Demographic Data?

While this question seems simple enough, there may be certain terms unfamiliar to some readers. Defining these terms will not only make this article clearer, but it may also help you in your personal life. For example, at a party you might impress your guests by defining economic and demographic data and pointing out the distinction between a census and a survey.

Demographic data usually refers to characteristics of people (e.g., age, language, occupation, income). People, in turn, can consist of individuals, heads-of-households, households, or families. Economic data is generally collected from business establishments. Examples of economic data include the number of establishments in a particular industry, the number of employees, and payroll items. One might think of the income of an individual as economic data, however for the purposes of this article I will consider it demographic data.

In addition, the terms census, survey, aggregated, and projected are frequently used throughout this article. The goal of a census is to enumerate all the units in question (e.g., people, business establishments, government agencies, etc.). This is sometimes called the "population." A survey is based on a sample of the units of interest (i.e., a small part of the population). Also, in the sections below that deal with

censuses, the term aggregation appears fairly often. Just so you do not have to search madly for your Webster's, aggregated data is data that has been summed. Finally, this paper contains a section on projected economic data. In this case, the Commerce Department is projecting (into the future) the value of variables such as personal income.

The Decennial Census of Population and Housing

One of the best sources of subnational demographic data is the Decennial Census of Population and Housing, conducted by the U.S. Census Bureau under the Department of Commerce every 10 years (years ending in "0").[2] All households in the U.S. receive either a short or long-form questionnaire. While too numerous to list here, the short-form questionnaire reports a basic set of population characteristics including age, sex, race, household relationships, marital status and Hispanic origin. It is received by the majority of the population.

The long-form questionnaire is distributed to a sample of the population (i.e., those who did not receive the short-form questionnaire). It contains all the questions shown on the short-form, but also includes such variables as income, poverty status, education, citizenship, migration, fertility, ancestry, labor force, occupation, language spoken at home, and disability. The important distinction is that the variables reported on the short-form are based on a census of the population. Those shown on the long-form are based on a sample, approximately 17 percent of the population.

The U.S. Census Bureau releases the Census of Population and Housing data aggregated by various geographic areas. While these geographical groups are again too numerous to list here, suffice to say that regions, states, counties, Metropolitan Statistical Areas (MSA), townships, census places, census tracks (i.e., neighborhoods), and blocks are included. City blocks are the smallest geographic units of population and housing data. However, not all variables are available at the block level. As a general rule, those variables reported on the short-form questionnaire (i.e., 100 percent) are available at geographic levels that range from the U.S. to city blocks. The smallest geographic unit for long-form variables is zip codes. However, it must be stressed that zip codes are designed by the U.S. Postal Service, not the Census Bureau. Consequently, zip codes do not conform to other geographic boundaries because they cross tracks, counties, and even state borders. In addition, the Postal Service regularly adds and modifies zip codes.

The data can be obtained in several formats including printed reports, computer tapes, and CD-ROMs (read only laser disks). The printed reports are labeled CPH (Census of Population and Housing), followed by numbers and letters that correspond to census or sample component and geographic area. For example, the label "Series 1990 CP-1" indicates the 1990 Census ("Series 1990"); population characteristics but no housing characteristics ("CP"); and population rather than sample data ("1"). An additional digit (not shown here) would indicate the geographic area.

These same data stored on computer tapes and CD-ROMs are referred to as summary tape files (STF). Like the printed reports, STFs are labeled with numbers and letters that indicate whether the data is 100 percent of the population or sample component and the corresponding geographical areas. For example, STF3-b indicates sample data ("3") for zip codes ("b").

Computer tape and CD-ROM media contain more information than listed in the printed reports. However, computer tapes are comparatively expensive in that they require considerable computer facilities and programming expertise. By contrast, the Census Bureau designed their CD-ROMs to be inexpensive in price and "user friendly," though users must have a CD-ROM reader linked to their personal computers.

If all these labels and computer talk have not yet driven our researcher to seek a new career, let's consider how she might use the Census of Population and Housing data in a simplified example. Suppose studies conducted at the Chicago DORA site suggest that young people (age 16-29) are less compliant than older taxpayers. As a result, the IRS decides to increase its taxpayer assistance to young people in the State of Illinois. Our Chicago DORA analyst is assigned the task of identifying areas of this state with comparatively high populations of people in this age group. To complete this task, she decides that the solution is to analyze the age data supplied by the Census of Population and Housing "Series 1990 STF1-a" CD-ROM at both the county and MSA level.

The Economic Censuses

In addition to the Decennial Census of Population and Housing, the Census Bureau conducts Economic Censuses every 5 years (years ending in "7" and "2"). The Economic Censuses provide statistics about business establishments. By definition, an establishment is "... a business or industrial unit at a single geographic location that produces or distributes goods or performs services."[3] With a few exceptions, the 1992 Economic Censuses will also include non-employee businesses (i.e., the self-employed).[4] According to the Bureau, the Economic Censuses cover roughly 98 percent of the U.S. economy.[5]

The economic censuses cover the following industry sectors: (1) retail trade; (2) wholesale trade; (3) transportation; (4) manufacturers; (5) mineral industries; (6) construction industries; and (7) finance, insurance, and real estate.[6] The data are tabulated on the basis of Standard Industrial Classification (SIC) codes. To elaborate, the economy is divided into broad divisions (e.g., manufacturing, construc-

tion, wholesale trade, retail trade, etc.). In turn, these divisions are subdivided into two-digit major industry groups, three-digit industry groups, and four-digit industries. As an example, let's use one of my personal favorites—pickle, sauce, and salad dressing manufacturing. Here, manufacturing is the division, the major industry group is food and kindred products (SIC code 20), the industry group is preserved fruits and vegetables (SIC code 203), and pickles, sauce, and salad dressing manufacturing is the industry that corresponds to SIC code 2035 (certainly a mouthful).

In general, the Economic Censuses provide information pertaining to the number of establishments, employment, sales, operating expenses, capital expenditures, and inventories by geographic area. The geographic areas include the U.S., regions, states, counties, MSAs, incorporated places, townships, and zip codes. However, variables provided by the Economic Censuses vary depending on the division and geographic area in question. The greatest variety of statistics and the most detailed classifications occur at the national level. Economic detail and coverage are reduced for smaller geographic areas. For example, counts of establishments with payroll are available for all the major divisions covered by the Economic Censuses at the U.S., state, and MSA level. However, at the zip code level, the number of establishments with payroll is only available for the retail trade, service industries, and manufacturing divisions.

Economic Censuses' products include paper reports, computer tapes, and CD-ROM media. Like the Decennial Census of Population and Housing data products, the computer tapes and CD-ROMs contain more information than found on the printed reports. The computer tapes, however, require more facility and programming resources than do CD-ROMs.

To imagine how a research analyst might use the Economic Censuses, let's go back to our Chicago DORA analyst. For another study, she may want to become familiar with the number of establishments and payroll characteristics of the manufacturing industries located in the MSAs (e.g., Chicago, Champaign, etc.) of Illinois. If this were the case, the Economic Census of Manufacturing would be a good place to look for this information.

County Business Patterns

While the Economic Censuses are great sources of subnational economic data for business establishments, they are only conducted on a 5-year basis. In between censuses, researchers can consider using data from County Business Patterns which are updated annually, and also produced by the Census Bureau. While not technically based on a survey, County Business Patterns data are based on information obtained from the most recent set of economic censuses combined with administrative records. The administrative record data, you may be surprised to know, is actually data supplied under law to the Census Bureau by the IRS. It is the employment and wage records shown on Form 941, "Employers Quarterly Federal Tax Return."

Like the Economic Censuses, County Business Patterns data are tabulated by industry and SIC codes. For example, according to the 1990 edition of County Business Patterns, there were 25 pickle, sauce, and salad dressing manufacturing establishments in the State of Illinois. The data are available at a U.S. summary level, plus separate reports for each state (down to the county level) and the District of Columbia. At the county level, industries with fewer than 50 employees are included in the total shown for the next broader industry group of which it is a part. For example, our Chicago DORA analyst can not obtain information about pickle, sauce, and salad dressing manufactures (SIC code 2035) for Champaign county. Rather, the next largest category (three-digit industry group), preserved fruits and vegetables or SIC code 203, would have to suffice. Note that County Business Patterns exclude non-employee businesses (i.e., the self-employed), farm workers and most government employees.

County Business Patterns are available as printed reports, on computer tape and on CD-ROM.

Bureau of Labor Statistics

In addition to the Census Bureau, the Bureau of Labor Statistics (BLS) under the Department of Labor offers subnational economic data. In particular, BLS offers average working hours and earnings, employment levels, and consumer price information for states and, in some cases, MSAs. Average hours and earnings data are available by industry on a monthly basis, with more industry detail provided on an annual basis. Labor force and employment data are also available by industry on a monthly basis. Consumer price data is available on a monthly, bimonthly, and annual basis depending on the size of the geographic area. For economically large states (CA, FL, IL, MA, MI, NC, NJ, NY, OH, PA, and TX) and large MSAs (New York City and Los Angeles), these figures are available on a monthly basis. Consumer price information for smaller states and MSAs are provided on an annual basis.

This data could be useful if our Chicago DORA analyst were interested in the potential relationship between unemployment and tax compliance in her district. For example, she could obtain unemployment data for the State of Illinois and the following MSAs: Aurora-Elgin, Bloomington-Normal, Champaign-Urbana, Chicago, Davenport-Rock Island, Decatur, Joliet, Kankakee, Lake County, Peoria, Rockford, and Springfield.

Bureau of Labor Statistics data can be obtained in printed format and, for some products, on computer tape.

Bureau of Economic Analysis—Regional Products

In this section, I introduce projected data supplied by the Bureau of Economic Analysis (BEA) which is part of the Department of Commerce. Within BEA, the Projections Branch of the Regional Economic Analysis Division (READ), produces subnational economic projections organized into three volumes: (1) States and the Nation; (2) MSAs and the Nation; and (3) "BEA economic areas" and the Nation.

A BEA economic area consists of an MSA (referred to as a node by BEA) and the surrounding counties that are economically related to the MSA. For example, if the Chicago DORA analyst used READ projections of the Champaign-Urbana economic area, this would include not only the Champaign-Urbana MSA but also the non-metropolitan portions of Coles, Cumberland, Douglas, Edgar, Ford, Platt, and Vermillion, Illinois. Therefore, BEA economic areas are more inclusive than MSAs but smaller than states.

The READ projection volumes cover population, personal income, and earnings categorized by selected industry (e.g., agriculture, mining, construction, manufacturing, transportation, etc.). In addition, employment by industry is also included. BEA, READ publishes the three projection volumes every 5 years. The most recent projection volumes were released in 1990, with the next release scheduled for 1995. These projections are available as printed volumes and CD-ROM media. The CD-ROMs are relatively inexpensive and contain all three volumes.

State and Regional Sources

In addition to its Washington, D.C. staff, the Census Bureau has what it refers to as its "friends." These friends of the Census Bureau are State Data Centers (SDC) and Business/Industry Data Centers (BIDC). Accordingly, the Bureau and SDCs/BIDCs have a barter arrangement. The Census Bureau provides its friends with statistical publications, maps, subscriptions, computer tapes, CD-ROM discs (all for their particular states and regions), and basic product training. In turn, the SDCs and BIDCs help disperse these data to the public. For example, our Chicago DORA analyst can more easily obtain economic and demographic data for her geographical area by contacting the Illinois SDC. In addition, SDCs and BIDCs are typically State government agencies, State libraries, or university research centers that can likely direct data users to other sources of information.

Similarly, IRS researchers interested in employment data may find it easier to deal with BLS Regional Offices for their particular geographic area. Employment related data (e.g., labor force participation, employment, unemployment, etc.) published at state and MSA levels are available from each of BLS' 10 Regional Offices. For example, if our Chicago DORA analyst were interested in the size of the labor force for the State of Illinois, she would contact BLS Region V for this information.

Reference Materials

The Census Bureau offers several terrific reference sources of economic and demographic data. For instance, the *Statistical Abstract of the United States* contains roughly 1,400 tables reporting data on a wide variety of subjects that range from population and vital statistics to personal computer use and pet ownership. Geographic coverage, depending on the variable, is provided for the U.S., States, MSAs (in some cases cities), and counties. The *Statistical Abstract of the United States* is a widely used information source and should be regarded as a "must have" in any research group. It is available in printed form and, beginning with the 1993 edition, on CD-ROM.

The *Census Catalog and Guide* is a comprehensive source of data products available from the Census Bureau. The Census Bureau, it should be noted, is considered the "fact finder of the nation." Therefore, the data products reported in this publication are quite numerous. In addition to the data products described above, the *Census Catalog and Guide* lists products developed from the Bureau's many surveys and other censuses (e.g., the Census of Government). Also, it includes a "Sources of Assistance" section designed to aid researchers in their quest for data. For example, this section provides lists of key sources of data and assistance in the areas of regional information services, data centers, and other Federal sources of information. Like the *Statistical Abstract*, the *Census Catalog and Guide* should be readily accessible within every research group.

The *Statistical Abstract of the United States and the Census Catalog and Guide* will provide IRS research staff such as DORA analysts with ample information on data and data products available from the Census Bureau and other Federal agencies. However, the true economic and demographic data connoisseur will appreciate a subscription to the *Census and You*. The *Census and You* is a monthly news publication of the Census Bureau that reports the latest data products available as well as articles that highlight recent studies conducted by the Bureau.

Protecting the Privacy of Taxpayers

Employees in the IRS, the Census Bureau and all other government agencies must be extremely conscientious of their duty to protect taxpayer privacy and appropriately safeguard confidential information. In fact, the Census Bureau is constitutionally mandated to protect the privacy of survey and census respondents. In addition, IRS staff making use of commonly available economic and demographic data

must be alert to the possibility that misperceptions might arise among the general public and be ready to appropriately respond should such a misunderstanding surface. Concern in this matter is easily justified—ponder, for a moment, the repercussions of the public's reaction to a mistaken idea that the Census Bureau provides individual responses to the IRS. Such a misperception would no doubt reduce participation in Census sponsored surveys of various types to the detriment of public policy action we might take as a nation based on such data.

The Census Bureau uses several tools to protect the privacy of individual respondents. Using the Decennial Census of Population, for example, only aggregated data are available for use. Aggregation across geographic areas prevents users from case-by-case analyses. In addition to aggregation, the Census Bureau uses geography as a privacy safeguard. As mentioned above, the smallest geographical area available for variables that may be regarded as more sensitive (e.g., income and occupation) is zip codes. Less sensitive variables are accessible at the block level. Similarly, only a broad set of variables are actually measured by a census (i.e., short-form variables). More detailed variables (e.g., income, occupation, education, etc.) are based on a sample of the population.

Despite these safeguards, however, IRS users of Census Bureau and other government data have a distinct responsibility. Under no circumstances should IRS users make any attempts to identify the individuals or firms that participate in government censuses and surveys unless part of a legally sanctioned exchange such as the administrative records discussed earlier under County Business Patterns. Furthermore, IRS users must be aware that even the perception of privacy violations can have the serious consequence of decreased compliance with tax laws and decreased participation in government censuses and surveys.

Conclusion

This article introduced sources of subnational economic and demographic data. In general, censuses conducted by the U.S. Census Bureau are among the best of these sources. In addition, the Census Bureau and the Bureau of Labor Statistics have regional offices and affiliated data centers that can be used to obtain data at geographic areas below U.S. levels. The reference materials described above should get any analyst searching for data off to a good start. Also, it is paramount that IRS analysts use Census Bureau and other government data responsibly. Violations or the perception of violations of the public's privacy must be prohibited.

Endnotes

[1]Only basic geographic areas, such as states and zip codes, are addressed in this paper. For more information about Census Bureau geographic concepts, contact the Census Bureau as listed in the appendix of this article.

[2]The Current Population Survey (CPS) is not addressed in this paper. Largely, the CPS is designed to produce U.S. estimates and, to a limited extent, on a state basis. The CPS collects monthly employment related information and special topics, such as income, on an annual basis. While ideal for generating time-series data sets, the CPS has only limited geographic detail. For information about the CPS, contact the Census Bureau, as listed in the appendix to this article.

[3]U.S. Department of Commerce, Bureau of the Census, "Guide to the 1987 Economic Censuses and Related Statistics," January 1990.

[4]The exceptions consist of the Census of Manufacturing and the Census of Wholesale Trade.

[5]U.S. Department of Commerce, Bureau of the Census, "Census and You," Volume 28, No. 4, April 1993.

[6]The Census of Finance, Insurance, and Real Estate began with the 1992 Economic Censuses. In addition, the 1992 Census of Transportation was expanded to include communication and utility sectors.

Appendix

The following contacts and telephone numbers are made available to the public by each respective agency.

The U.S. Census Bureau

Washington, D.C. Staff:

Customer Services	(301) 763-4100
Decennial Census	(301) 763-4251
Economic Censuses Products	(301) 763-5430
County Business Patterns	(301) 763-5430
Geographic Concepts and Products	(301) 763-5720
Current Population Survey	(301) 763-2773

Census Regional Offices

Atlanta, Georgia	(404) 730-3833
Boston, Massachusetts	(617) 424-0510
Charlotte, North Carolina	(704) 344-6144
Chicago, Illinois	(312) 353-0980
Dallas, Texas	(214) 767-7105
Denver, Colorado	(303) 969-7750
Detroit, Michigan	(313) 259-1875
Kansas City, Kansas	(913) 551-6711
Los Angeles, California	(818) 904-6339
New York, New York	(212) 264-4730
Philadelphia, Pennsylvania	(215) 597-8313
Seattle, Washington	(206) 728-5314

Bureau of Labor Statistics

Washington, D.C. Staff:

State and Area Data	(202) 606-6559
Inquiries and Correspondence	(202) 606-5885

BLS Regional Offices:

Region I, Boston, MA (ME, VT, NH, MA, CT, RI)	(617) 565-2327
Region II, New York, NY (NY, NJ, Puerto Rico, U.S. Virgin Islands)	(212) 337-2400
Region III, Philadelphia, PA (PA, DE, DC, MD, VA,WV)	(215) 596-1154
Region IV, Atlanta, GA (KY, TN, NC, SC, GA, AL, MS, FL)	(404) 347-4416
Region V, Chicago, IL (MN, WI, MI, IL, IN, OH)	(312) 353-1880
Region VI, Dallas, TX (NM, TX, OK, AR, LA)	(214) 767-6970
Regions VII and VIII, Kansas City, MO (NE, IA, KS, MO, MT, ND, WY, SD, UT, CO)	(816) 426-2481
Regions IX and X, San Francisco, CA (CA, NV, AZ, AK, WA, OR, ID, HI, Guam, American Samoa)	(415) 744-6600

Bureau of Economic Analysis

Regional Economic Information Service	(202) 606-3700

Government Printing Office (202) 783-3238

The Executive Management Support System (EMSS)

by Gregory E. Kane

During the past 4 years the Internal Revenue Service has tested whether off-the-shelf executive information system (EIS) software can be used to provide useful management information to the executives who need it. The Executive Management Support System (EMSS) was developed using EIS software and has proven to be a success. This article provides a brief overview of EMSS and highlights the analytical tools available in the system for analyzing large amounts of information quickly. Also, an example of the analysis capabilities available in EMSS is demonstrated using the accounts receivable dollar inventory (ARDI) application.

Introduction

Virtually every business, large or small, relies on information it has gathered, processed, and analyzed to learn more about how it is doing and to assist in every day business decisions. Executives require that information to be readily available, easily accessed and, most importantly, understandable. Many times the required data is distributed over different databases, in various locations, and in various formats. Pulling the data together in a coherent and understandable format is no easy task.

To solve this problem, many of the country's influential businesses, including the Internal Revenue Service, are testing state-of-the-art executive information system (EIS) software. An EIS is a hands-on-tool that focuses, filters, and organizes large amounts of management information from various sources so executives can make effective use of this information. It is a dynamic investigative and reporting tool which empowers executives by enabling them to personally probe and analyze corporate information with ease and without requiring a lot of computer related skills.[1]

The Executive Management Support System (EMSS) is the IRS' version of an executive information system. EMSS began approximately 4 years ago as a Tax Systems Modernization (TSM) prototype in IRS' North Atlantic Region. IRS' TSM effort is an integrated approach to designing, developing, and implementing new information systems, and using the information in ways never before possible.[2] EMSS is a natural extension of the TSM strategy to provide information at the right time, in the right place, and in ways which enable IRS employees to better serve their customers.

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Development of EMSS

The objective of the EMSS project was to determine whether commercial off the shelf EIS software could be used to consolidate, manipulate, and distribute useful management information quickly to the executives who needed it. Using software called Commander EIS by Comshare, Incorporated, an EIS was developed based around existing reporting systems utilized by IRS' Collection, Finance, Returns Processing, Personnel, and Problem Resolution functions. The first five applications were developed using existing databases and originally distributed to executives in the Brookhaven Service Center, North Atlantic Regional Office, Manhattan District, and the National Office.

At the end of a 1-year pilot, it was decided to continue the project and expand EMSS to include additional applications that would address issues critical to the entire Service. Interviews were conducted with selected IRS executives to determine their individual needs. Many useful applications resulted from their suggestions such as the Accounts Receivable Dollar Inventory (ARDI) application, the Nonfiler application, the Taxpayer Service Operational information application, and several others.

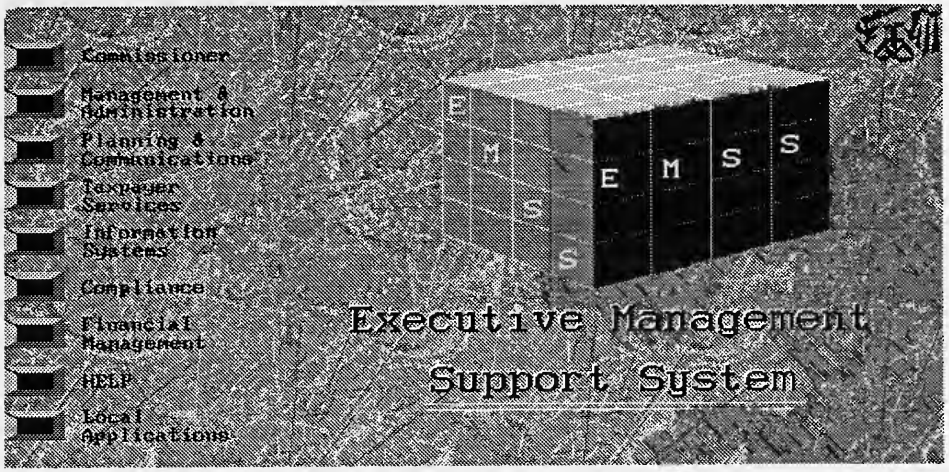
At the end of 1993, it was decided to make EMSS a full TSM project and connect all IRS' senior executives nationwide to the system.

Current EMSS System

The EMSS main menu mirrors the IRS' new National Office organizational structure and is divided into the seven management areas depicted in Figure 1.

A total of 16 operational applications currently exist on EMSS within the above 7 management areas. These applications report on some of the servicewide activities underway in

Figure 1
EMSS Main Menu Screen



support of the Service's mission and strategic initiatives. Selecting the appropriate management area on the main menu reveals one or more of the following applications:

- Problem Resolution
- Collection C-40 Reports
- Personnel
- Collection C-229 Annual Business Plan
- EEO ERR-16
- Collection C-229J Macro Measurements
- Returns Processing Business Plan
- Examination Reports
- Returns Processing Operational Data
- Accounts Receivable (ARDI)
- Taxpayer Services Operational Data
- Nonfiler
- NOCC
- Automated Finance System (AFS)
- Management Controls
- Prompt Payment

New applications are being designed covering such topics as: the Strategic Business Plan, Enforcement Revenue Information System, Information Reporting Program, Criminal Investigation, EP/EO, and Cost Analysis (Finance).

Briefing Book and Execu-view Features

Most EMSS applications have two basic components, a Briefing Book" and an "Execu-view." The Briefing Book is an electronic reporting tool designed to keep executives informed about the status of key areas. This tool lends itself to reports such as the IRS' Key Performance Indicators, the Annual Servicewide Operating Plan, and IRS' Strategic Initiatives. The Briefing Book displays the data in formats that cannot be altered by the user. Thus, it is crucial that executives provide input to those developing the applications, so that the pertinent information is displayed.

Some of the more useful Briefing Books incorporate the "exception highlighting" tool. This tool enables application developers (with thoughtful input from executives and staff) to establish exception rules within the Briefing Book usually based on a variance or established threshold. It is especially useful in applications which report on an established success criteria. For example, a success criteria might be established to increase the number of closures in a program by 20 percent over the previous year's totals. The exception tool could then depict graphically (with say different colors) whether the established success criterion was being fully met, barely met, or not met.

Whereas the Briefing Book is an electronic collection of preconceived status reports and charts programmed by developers in the function, a more robust tool available in EMSS is the Execu-view. The Execu-view allows executives to view specific information from the data summarized in the Briefing Book. This tool enables an executive to connect to the Detroit Computing Center (DCC) and view detailed data from any point of view that is meaningful to the analysis he/she wishes to perform. EMSS handles enormous amounts of data with ease and enables users to slice the data into manage-

able pieces. Users can view, graph, and even perform statistical calculations on the data within the Execu-view. Information viewed through an Execu-view can be sent to a local printer, a file on a personal computer, and/or saved in a feature called Reminder for retrieval at a later date.[3]

Example of Execu-view—The ARDI Application

One example which demonstrates the multidimensional functionality of Execu-view on EMSS is the accounts receivable dollar inventory (ARDI) application. Prior to the ARDI application, accounts receivable data resided on magnetic tape at the Martinsburg Computing Center. There were over 600 fixed format reports generated each month for the Returns Processing Accounts Receivable Focal Point Section at the National Office. For the most part, the data was summarized at the national and service center levels and required individual users to request copies of these fixed format files from the Focal Point section and then import them into spreadsheets for review and analysis. While functional, this format was not flexible and analyses of multiple files was difficult and time consuming. By the time the files were manipulated, analyzed, and a final report prepared, the information was months old.

Now using EMSS, a large portion of the ARDI data is stored in a centralized file in DCC. EMSS enables users to access this enormous amount of data simultaneously and slice it into manageable pieces. The application provides monthly accounts receivable data quickly and down to the district office level for the first time enabling IRS regional offices and service centers to evaluate specific accounts receivable problems within their service area.

The ARDI application begins with a Briefing Book summarizing the big-picture view of the ARDI data. The opening Briefing Book provides a graphic illustration of the monthly trends in total ARDI and the associated component called "currently not collectible" (CNC) for each of the past 4 years for the entire nation—as shown in Figure 2.

On this opening screen there are also Briefing Books for each region. The regional components can be viewed by selecting one of the region boxes on the left side of the screen. These regional Briefing Books provide: monthly trend graphs for fiscal years 1993 and 1994; graphs showing the percent change from the prior month by masterfile status (e.g. taxpayer delinquent accounts (TDA), currently not collectible, installment agreements, etc.); and the percent change from the prior month by district office and service center within each region (see Figure 3).

Figure 2
ARDI Application—Briefing Book for National Level

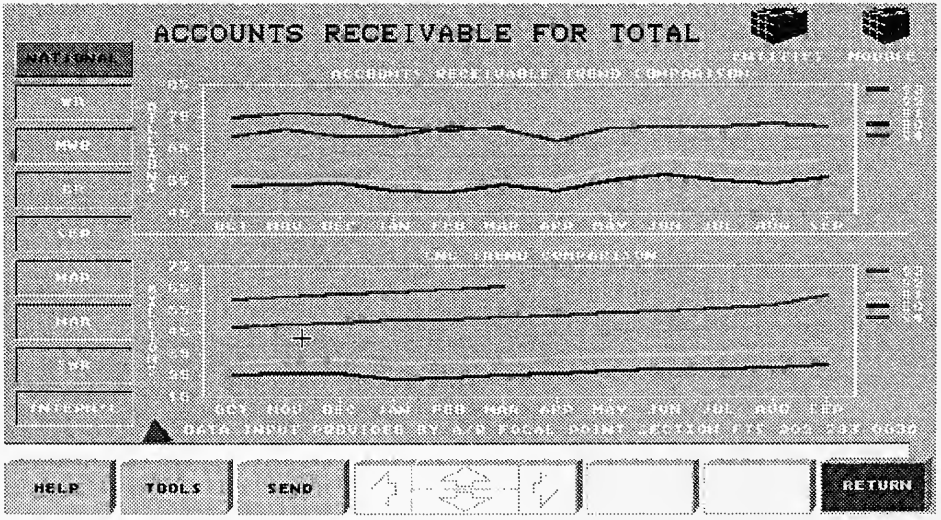
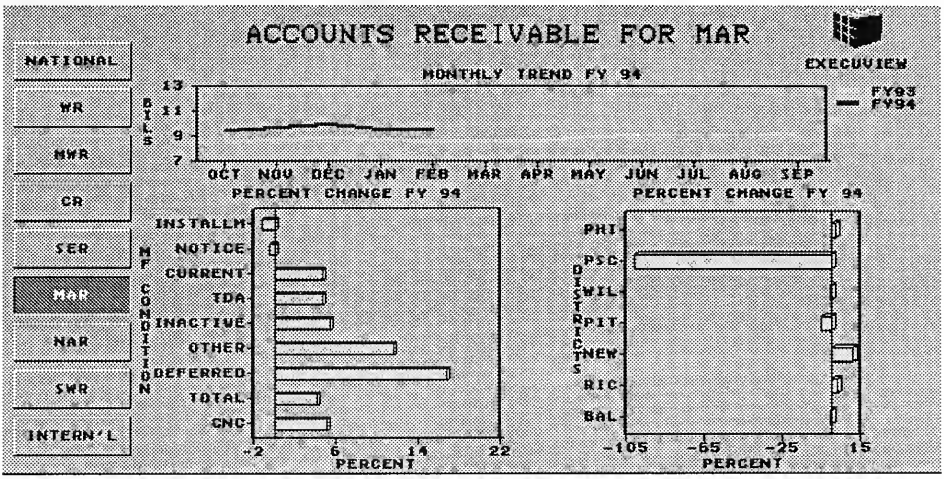


Figure 3
Ardi Application—Briefing Book for Mid-Atlantic Region

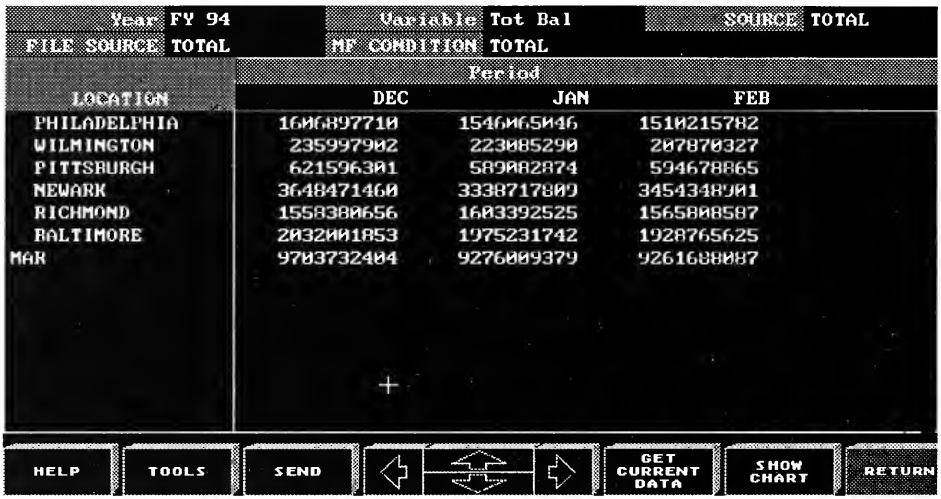


From the screen shown in Figure 3, it is possible to then further customize one's analysis using Execu-view. To get a better idea of how one might use Execu-view in the ARDI application, let's analyze month to month changes in ARDI for Mid-Atlantic Region (MAR). To begin the analysis, you would first select the Execu-view icon in the upper right corner of Figure 3. The spreadsheet shown in Figure 4 then appears with ARDI levels by region along the left side of the worksheet (i.e., rows) and the months across the top (i.e., columns).

Figure 4
ARDI Application—Execu-view for Regions

MF CONDITION TOTAL		Variable Tot Bal	SOURCE TOTAL
FILE SOURCE TOTAL		Year FY 94	
	Period		
LOCATION	DEC	JAN	FEB
SWR	11208771499	10725107204	10548192574
NAR	9483724746	9190072696	9056220545
SER	12385947535	12076455976	11757389652
CR	5048246776	4831096036	4806691700
MWR	7955425550	6830945545	6320005989
WR	18509292287	17706997705	17448090073
MAR	9703732404	9276009379	9261688087
INT'L	890855895	892437234	933989873
TOTAL	75185996692	71529121775	70132268493

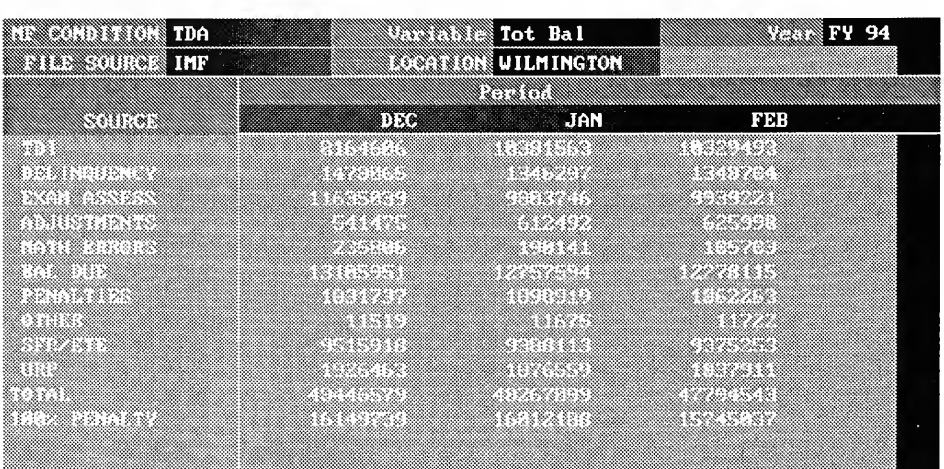
Figure 5
ARDI Application—Execu-view for Mid-Atlantic Region



To view the district office figures within MAR for example, simply click on "MAR" and the screen shown in Figure 5 would appear.

Thus, with a few simple operations, one can easily access monthly ARDI data at the district level. In addition, while this example uses total ARDI figures, it could easily be repeated for specific "masterfile conditions" (i.e., statuses). For ex-

Figure 6
ARDI Application—Execu-view for Wilmington District



ample, after performing some initial analysis, assume you determine that Wilmington District's TDA status accounts need further investigation by source of assessment. You can then simply click on "WILMINGTON" in Figure 5 and a new screen appears (see Figure 6). Clicking on the box labeled "MF CONDITION" in Figure 6 limits the data to only the TDA status.

You can continue this "drilling" process until you have isolated the issue or problem you are probing. Once you have finished your analysis you can now use the flexible reporting tools to create ranges of reports and save them in Reminder to retrieve them at a later date, print them out to your personal computer, or save them to a DOS file for manipulation in other software packages.

Similar routines can be used to profile ARDI problems by type of taxpayer (i.e. Schedule C filer, wage earner, etc.) and by Principal Industry Activity (PIA) codes. This application thus enables users to do limited market segmentation—i.e., examine ARDI data by homogeneous groups of taxpayers.

EMSS As An Analytical Tool

EMSS was designed with executives in mind. However, the range of its analytical capabilities also makes it a valuable tool for analysts. Trained users can write their own applications which access enormous amounts of data stored on the mainframe system in DCC or stored in the databases they maintain individually on their PCs. EMSS alleviates the need for manual reports and the need to maintain multiple reporting systems. Analysts no longer have to do massive amounts of data crunching prior to analyzing the data and can perform a wide variety of ad hoc queries on the data. For example, using the ARDI and Nonfiler information, analysts finally have been able to probe the detailed data and perform analysis from a variety of different perspectives to identify trends, emerging problems, and to profile market segments.

The flexibility provided in EMSS allows analysts to consolidate data from spreadsheets, PC databases, and flat files into one application. After the data provider has looked at the data, he/she can better understand the relationships within it and develop the rules and layouts to best display it to the people who need it. The software allows routines to be built to perform simple statistics, regression analysis, forecasting, and other ad hoc analysis. Applications can be built in 1 to 2 days and developers can determine at what levels the data should be shared.

Conclusion

EMSS is a substantial first step in providing useful information timely and to the people who need it. The prototype proved that EIS software does work and provides the necessary tools to pull together and manipulate large amounts of data. A key to the success of EMSS is for executives to look beyond the traditional ways of reporting and analyzing data. The EMSS Project Team will train interested executives and staff to build and maintain applications for their individual functions. The long term expectation of the EMSS Project Team is that each function will develop and maintain their own individual applications, and that the EMSS project staff will dissolve in 3 years. "In essence, such an approach to an organization-wide decision support system will not only support individual thinking and decision making, but more importantly will allow group thinking and decision making so that synergism can take effect."[4]

Endnotes

[1]Comshare, Inc., "Commander EIS Executives Guide," September 1990, pp. 1-61.

[2]Internal Revenue Service, "Strategic Business Plan FY 1994 and Beyond," Document 7655 (Rev. 9-93).

[3]The Reminder application gives executives the convenience of an electronic tickler. It is a tool to file personal memos and even saved workstation screens. An executive can use Reminder to automatically alert them to items the previously entered for follow-up. Comshare, Inc., "Commander EIS Executives Guide," September 1990, pp. 1-61.

[4]Thierauf, Robert J., "New Directions in MIS Management: A Guide For The 1990s," 1988, p. 185.

Employees' and Managers' Views of ACS

by Shien S. Perng and R. Ross Saberin

As part of an on-going evaluation of the Automated Collection System (ACS), surveys are conducted to measure employee and manager perceptions about various areas of ACS operations. The latest survey, conducted in early 1992, revealed the following: employees and managers were not highly satisfied with the training they received; the most important factor contributing to stress for ACS employees was pressure from management, and for ACS managers it was the amount of work; respondents believed that taxpayers want to resolve their delinquencies but do not understand the collection process or their rights to appeal; and employees and managers were proud and willing to work for the IRS, but would rather not work in ACS. Respondents made many suggestions for improvement of ACS training and operations.

Background

In 1983-1984, IRS implemented the Automated Collection System (ACS) to facilitate and streamline Collection activities. ACS is a computerized telephone system that is capable of selecting a taxpayer case to call according to a priority score, displaying all relevant data on the case, and otherwise facilitating collection of the money owed by the taxpayer. It can also gather information about outgoing and incoming calls. As part of a on-going ACS evaluation effort, a survey was conducted to:

- measure employee and manager perceptions about the current ACS training, workload and work environment
- evaluate the quality of ACS operations and service
- identify problem areas in the system that need further attention and
- solicit ACS employee and manager suggestions for ACS service and system improvements

This article reports the significant results of this survey.

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R. Ross Saberin *is an Operations Research Analyst in the Collection Research Section, Office of Assistant Commissioner (Collection). He received his master's degree in educational research from the University of Pittsburgh in 1972 and has been with the IRS for 3 years. He has published a number of research articles in* ***The IRS Research Bulletin.***

Methodology

The survey involved all 522 managers, team leaders, customer specialists, and quality and systems analysts in ACS nationwide. It also included a random sample of 641 tax examiners in ACS nationwide. Participants were guaranteed confidentiality to ensure honest opinions. Questionnaires were mailed in early March 1992. A total of 220 responses were received from managers and 462 responses from other employees. The overall response rate was about 58 percent.

The ratings for all questions were based on a scale of 1 to 6 with 1 being poor, difficult, insignificant, or strongly disagree and 6 being excellent, easy, significant, or strongly agree, depending on the type of question rated. This means the average would be 3.5 had the ratings been randomly assigned, with about equal numbers of respondents giving a rating higher than 3.5 and a lower than 3.5. Thus, if good training had been provided, the average rating would be substantially higher than 3.5. In this study, we considered an average rating over 4.5 as high, an average rating from 3.8 to 4.5 as mediocre, an average rating of under 3.8 as low, and an average rating of under 3.2 as extremely low.

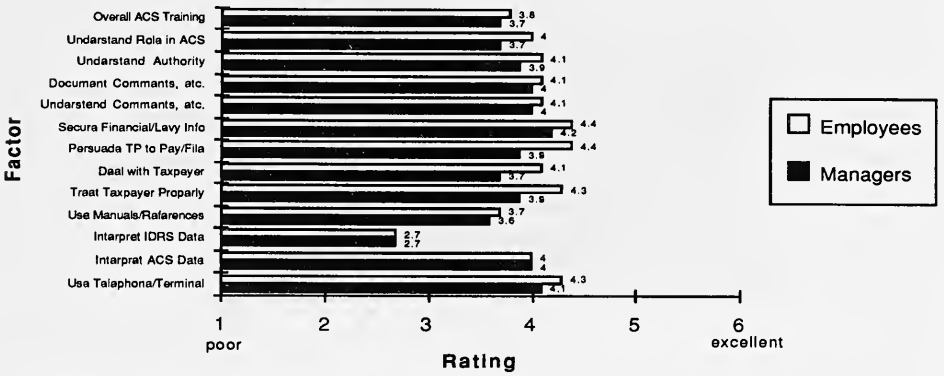
Major Findings of the Survey

Grouped below are the major findings by type of questions asked. The results were weighted to account for the different sampling rates so that they reflected the opinions of all ACS employees and managers nationwide.

Background of the Survey Universe

The survey showed that 60 percent of ACS managers had been with ACS for over 5 years, while 84 percent had been with ACS for over 3 years. Only 25 percent of ACS employees had been with ACS for over 5 years, while 50 percent had been with ACS for over 3 years. An overwhelming proportion (66 percent) of ACS employees did not work for the IRS

Figure 1
Average Ratings for Initial Training



Note: Averages are weighted based on 454-459 employees and 212-216 managers.

prior to joining ACS, while only 38 percent of ACS managers did not. Also, 38 percent of managers had been with IRS for more than 5 years before joining ACS.

The educational profiles for the employees and the managers were surprisingly similar. Forty-five percent of employees and 48 percent of managers had some college, 35 percent of employees and 29 percent of managers had a college degree, and 6 percent of employees and 7 percent of managers had completed graduate school.

Training

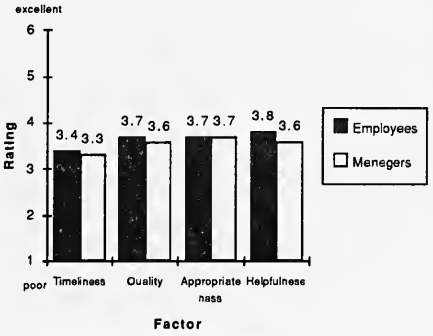
ACS provides initial training for new employees and for new managers, and subsequent training for updating and refreshment purposes. We asked the respondents to rate the initial ACS training by 13 different factors and the subsequent training on four attributes.

Managers were not highly satisfied with the initial ACS training they received with ratings generally in the "3" to "4" point range on a scale where the top rating of "6" indicates "excellent." Employees were only slightly less dissatisfied. Figure 1 shows the average rating given by managers and employees for the initial training they received. The initial training for managers was rated consistently lower than the initial training for employees for all factors. None of the 13 factors received a high average rating from managers or from employees.

The factor "interpreting IDRS data" received the lowest rating from both the employees and the managers, averaging only 2.7. Also, for "using manuals and other reference materials", the average rating was only 3.7 from the employees and 3.6 from the managers, and for the overall initial training, the average was only 3.8 and 3.7, respectively. Training on how to secure financial and levy information was rated highest among all factors; the average ratings were 4.4 and 4.2, respectively.

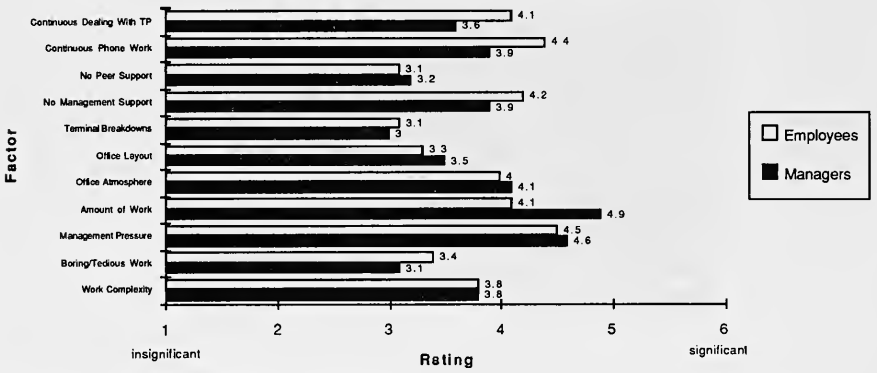
Figure 2 shows the average rating for the subsequent training on four attributes: timeliness, quality, appropriateness, and helpfulness. Again, the managers gave a rating lower than the employees. The average ratings were low (between 3 and 4) on all four attributes.

Figure 2
Average Ratings for Subsequent Training



Note. Averages are weighted based on 459 employees and 216-216 managers.

Figure 3
Average Ratings on the Importance of Factors Contributing to Stress



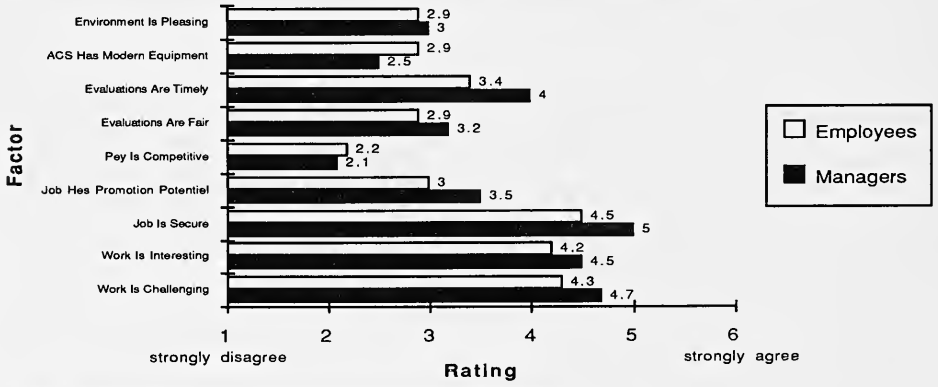
Note: Averages are weighted based on 453-460 employees and 216-219 managers.

Work Environment and Conditions

Respondents were asked to rate the importance of 11 factors contributing to stress in their work. Figure 3 shows the average ratings of these factors. The views of employees and managers were somewhat different. For employees, the factors rated most important were: "pressure from management" (4.5) and "continuous phone work" (4.4). For managers, the most important factors were: "amount of work" (4.9) and "pressure from management" (4.5).

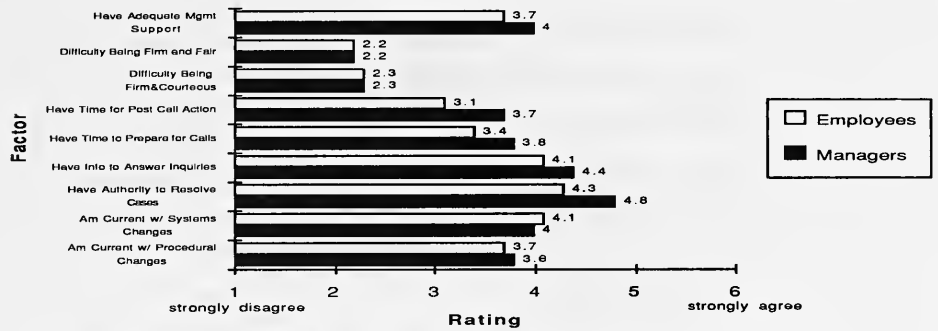
We also asked the respondents to rate their agreement with nine statements about ACS work. Figure 4 shows the average ratings given by employees and managers. The statements with which managers strongly agreed included: "job is secure" (5.0), "work is challenging" (4.7), and "work is interesting" (4.5). The employees also agreed with most of the same statements, but not as strongly: "job is secure" (4.5), "work is challenging" (4.3), and "work is interesting" (4.2). Both the employees and the managers expressed strong

Figure 4
Average Ratings for Agreeing With Statements About ACS Work



Note: Averages are weighted based on 458-462 employees and 216-218 managers.

Figure 5
Average Ratings for Agreeing With Statements About Work Conditions



Note: Averages are weighted based on 456-461 employees and 215-218 managers.

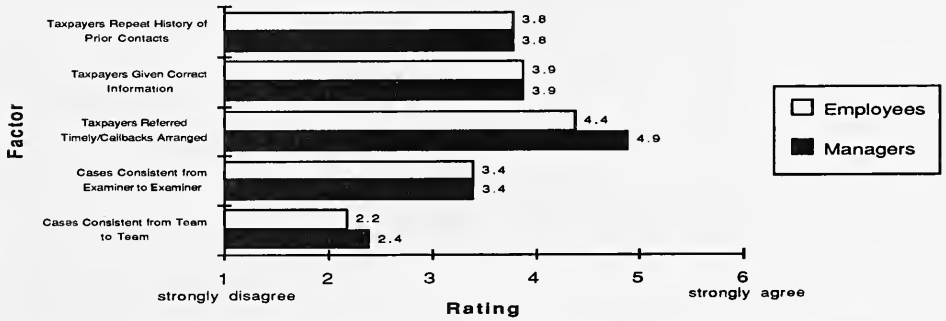
disagreement with other statements. For example, they very strongly disagreed with the statement that the "pay was competitive" (2.2 by employees and 2.1 by managers).

Respondents were asked to rate their agreement with nine statements about work conditions in ACS. Figure 5 compares the average ratings. The rating patterns for employees and for managers were somewhat similar. They agreed with "I have the authority to resolve cases" (4.3 by employees and 4.8 by managers), "I have information to answer taxpayer inquiries" (4.1 and 4.4, respectively), and "I can keep current with systems changes" (4.1 and 4.0, respectively). They strongly disagreed with "I have difficulty being firm and fair" (2.2 by both employees and managers), and with "I have difficulty being firm and courteous" (2.3 by both employees and managers).

Work Performed and Taxpayers Contacted

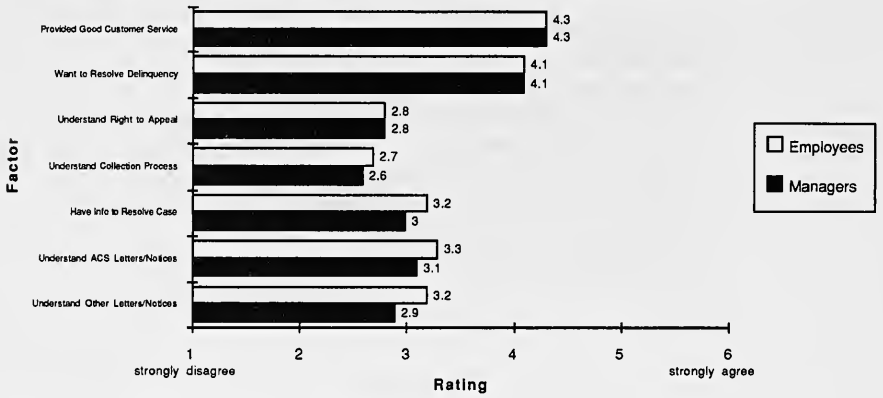
Respondents were asked to rate their agreement with five statements about the work performed by ACS. Figure 6 shows their average ratings. Both the employees and the managers agreed with "Taxpayers who ask to speak to managers were referred timely or callbacks were arranged" (4.4 and 4.9, respectively). They very strongly disagreed with "Cases were handled consistently from team to team" (2.2 and 2.4, respectively). They were somewhat neutral regarding other statements.

Figure 6
Average Ratings for Agreeing With Statements About ACS Work



Note. Averages are weighted and calculated based on 458-460 employees and 218-219 managers.

Figure 7
Average Ratings for Statements About Taxpayers Served by ACS



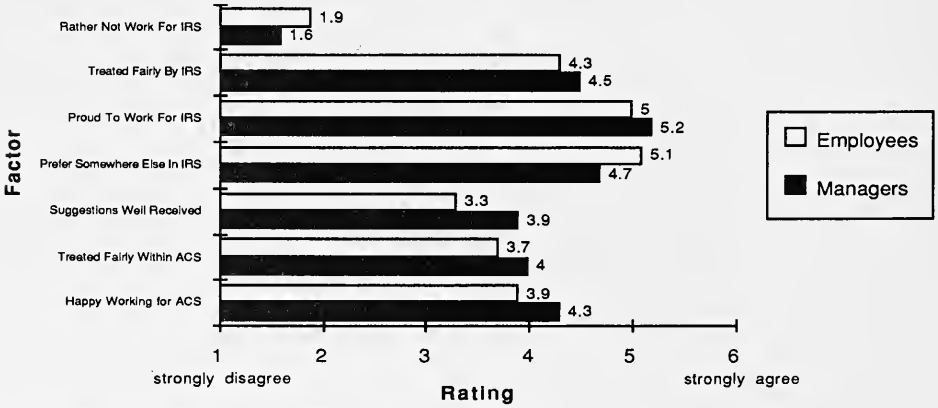
Note: Averages are weighted based on 459-461 employees and 217-219 managers.

Respondents were asked to rate their agreement with seven statements about the taxpayers they served. Figure 7 shows the average ratings for each statement. While they agreed to statements that taxpayers wanted to resolve their tax delinquencies and were provided good customer service, they did not think that taxpayers understood IRS letters or notices, or had information to resolve the case while on the phone. They strongly disagreed that the taxpayers understood the collection process (2.7 and 2.5, respectively), or their rights to appeal (2.8 by both employees and managers).

Miscellaneous

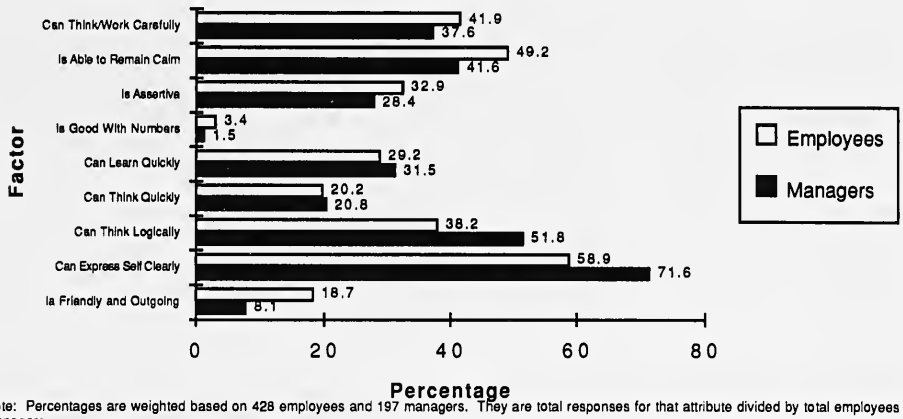
When asked about statements on ACS or IRS overall, employees strongly agreed (see Figure 8) with "I am proud to work for the IRS" (average rating 5.0 by employees, and 5.2

Figure 8
Average Ratings for Statements About Working at IRS/ACS



Note: Averages are weighted based on 447-452 employees and 212-215 managers.

Figure 9
Respondents Pick Three Qualities In a Person Suited for ACS Work



Note: Percentages are weighted based on 428 employees and 197 managers. They are total responses for that attribute divided by total employees or managers.

by managers), and "I would like the opportunity to work somewhere else in IRS, other than ACS" (5.1 and 4.7, respectively). The average rating for agreeing with "I would rather not work for the IRS" was only 1.8 from employees and 1.5 from managers, indicating extremely strong disagreement with the statement.

When asked to pick three qualities in a person best suited for ACS work, the results by both the employees and the managers were similar (see Figure 9). These qualities included: being able to express oneself clearly, being able to remain calm, being able to think and work carefully, and being able to think logically. Not many thought that being good with numbers or being outgoing and friendly were qualities best suited for ACS work.

Respondents' Suggestions for Improvement

To improve training, the most frequent suggestions included providing more detailed training, more proficient instructors, more on-the-job training, more IDRS training, and using more up-to-date training materials. To improve the ACS system, the most frequent suggestions included providing more current information, longer retention of information and more financial data. Also suggested were improving the coding of information, and improving the information structure and organization. To improve ACS operations and procedures, the most frequent suggestions included, providing for greater consistency and uniformity, simplifying procedures, and providing more timely issuance of procedures and Internal Revenue Manual (IRM) updates.

Conclusion

The survey revealed that employees and managers were not highly satisfied with the initial ACS training they received. They also felt that the subsequent ACS training was not very timely and not of very good quality.

The survey identified the most important factors contributing to stress in ACS work for employees as pressure from management. For managers it was the amount of work. The respondents believed that taxpayers were provided good customer service, and that taxpayers wanted to resolve their delinquencies. However, they felt strongly that the taxpayers did not understand the collection process or their rights to appeal.

The respondents felt strongly that they were proud to work for the IRS, and expressed a very strong desire to stay with IRS. However, they preferred to work somewhere other than ACS.

Follow-up to the Survey

Many changes have taken place in ACS since the survey was completed with several actions in line with the survey results. For instance, to improve IDRS training, training courses tailored to the needs of ACS employees have been prepared and readily accessible for each IDRS command code. To reduce the stress on managers caused by heavy workload, some authority and responsibility have been delegated to employees. This should also reduce the stress on employees caused by management pressure and make employees' work less monotonous. It also should improve employees' job satisfaction by allowing employees to make more case decisions without managerial approval.

Neural Networks and Discriminant Function: Alternative Techniques of Selecting Tax Returns for Audit

by Lance S. Asner

The IRS has used Discriminant Function (DIF) to select tax returns for audit for about 25 years. Neural networks were reviewed as an alternative to DIF. Both techniques were tested on the same returns and the results were compared for two audit classes. The results from conventional neural networks were generally inferior to DIF. However, a combination of part of IRS' DIF methodology with neural computing produced encouraging results for one audit class. Further research is needed to determine whether this approach can improve return selection in an operational setting enough to justify the substantial cost of implementing neural networks.

Background Of Audit Selection At IRS

Prior to 1963, all individual returns were selected for audit by manual review. Hundreds of the most experienced examiners sorted 20 million returns by hand every year. They selected returns, within general guidelines, according to their own best judgment. Shortcomings were: (1) the most experienced examiners were sidelined, (2) subjective judgments drove a system that lacked uniformity, and (3) only 35 percent of filings were screened.[1]

In 1963, a computer system for the first time identified tax returns for audit. Sets of criteria (mostly ratios) were gleaned from expert examiners and were applied to individual tax returns by computer. This system suffered from over-identification; the numbers of returns identified greatly exceeded IRS examination capacity. Large groups of returns were identified for audit, but noncompliance within groups could not be distinguished[2]

During the 1960s, discriminant function (DIF) was adapted for use with tax return data. DIF formulas were developed from audits of sample returns selected at random. The DIF formulas were used to assign scores to future filings. Soon after filing, each return received a DIF score; the higher the DIF score, the greater the probability of tax increase if examined. Tax returns with the highest DIF scores were made available to the field for manual review.[3]

In recent years, over 60 percent of individual audits were returns associated with DIF. The DIF system also includes corporations, S-corporations, and partnerships, in addition to individual returns. The DIF methodology has been improved with tabular and computer enhancements. A DIF Expert System now compresses the formula refinement phase that took weeks, into minutes, and permits inquiries into areas previously precluded by time constraints.[4]

A cross-functional task force of IRS experts in audit selection systems consulted with outside experts to explore alternatives to DIF.[5] Neural networks were reviewed by the task force, and were tested on two traditional audit classes of Individual tax returns. The DIF methodology was tested on the same classes as neural networks and results were compared as to average tax increases, high change rates, and no change rates at alternative levels of audit coverage. These comparative results are discussed below.

Neural Networks

Neural networks are usually associated with learning in biological systems. They have been most effective on complex problems with nonlinear solutions that were unsuited to other techniques. Neural networks have provided enhanced applications in such fields as mathematical modeling, forecasting, and pattern recognition.[6]

Neural networks are an application of artificial intelligence, whereas DIF is a statistical technique. Artificial intelligence and multivariate statistics are very different methods of data analysis. Multivariate statistics require assumptions about the data and essentially one "pass" through the data set for an optimal linear solution. Neural networks, however, require no assumptions about the data, and may require many passes (iterations) through a data set. Network configurations and nonlinear solutions are developed at the discretion of a skilled operator. The development of neural networks is often described as an art.

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Sample Data for Neural Networks and DIF Tests

The source of data was the Taxpayer Compliance Measurement Program, Phase III, Cycle 10 (III-10 TCMP). The III-10 TCMP was a sample of Individual tax returns (Forms 1040, 1040A, and 1040EZ) for tax year 1988 and processed during 1989. New national DIF formulas were developed from audits of the III-10 TCMP sample returns. The new formulas were implemented in 1993. In 1993, each of the 114 million Individual filings was computer screened and received a DIF score.

The III-10 TCMP was a stratified random sample of 54,088 Individual returns. Each sample return was intensely examined. The data base contained reported values, corrections by examiners, and total tax change. Sample returns were arranged among ten traditional, mutually exclusive, audit classes. Each sample return had a sampling weight, and all computations were on weighted data, to simulate the filing population.

This study involved small and large business classes. These classes were chosen for their homogeneity with respect to income and their disparity with respect to yield from audits. Small, medium, and large business classes were homogeneous in that Schedule C was a principal source of income. Schedule C also appeared in nonbusiness classes, but it was ***not*** a principal source of income.[7] However, small and large business classes were very different with respect to audit yield. "High yield" is defined as the dollar amount above which 10 percent of an audit class was noncompliant in tax liability. [8] The figure was much lower for the small business class. "High yield" defines the measure "Percent Of Returns With High Yield" (also referred to as the high change rate) which features prominently in this study. Classes were defined as follows:

- **Small Business Class** - Forms 1040 with Schedule C gross receipts under $25,000, and more income from business than nonbusiness sources. The 3,731 sample returns reflected a weighted population of 1,889,112.

- **Large Business Class** - Forms 1040 with Schedule C gross receipts of $100,000 or more. The 4,384 sample returns reflected a weighted population of 1,368,820.

TCMP data reflected dollar values reported by taxpayers. However, neural computing typically requires transforming data so that input values range between -1 and +1.[9] The contractor transformed each TCMP line item with six mathematical subroutines into values between -1 and +1. The best transform of each line item became its input for neural computing. This resulted in ***Transformed Taxpayer Entries*** for small and large business classes.

The contractor was also provided with TCMP data that had been transformed by IRS for its DIF formula development. Each line item was segmented into several intervals, and interval statistics replaced values reported by taxpayers. The contractor elected to use the intervals, but not the statistics. Intervals were defined as 0-1 variables; entries were "0" if outside an interval range, and "1" if within an interval. This resulted in ***DIF Interval Data*** from which neural networks were developed for the two classes.

The two DIF Tests were developed by the IRS task force for small and large businesses. They used the interval statistics that were provided the contractor. Neural networks were developed by the contractor on four data sets; small and large business classes, each with Transformed Taxpayer Entries and DIF Intervals. The small businesses had 52 line items reported by taxpayers, and large businesses 50 line items, in addition to sampling weight and tax change from audit.

Methodology — Neural Networks

Neural computing consisted of two distinct phases, the training phase and the testing phase. Each sample return was assigned to one phase or the other. Small and large business classes were randomly split in half, one-half for training and the other half for testing. Neural networks (and DIF Tests) developed on training-halves were evaluated on testing-halves.

Neural networks are defined in terms of (1) inputs, (2) hidden layers, (3) nodes in each hidden layer, and (4) outputs. "Learning" is described as occurring at the nodes of a hidden layer. The nodes of a hidden layer record interactions among inputs. The greater the number of nodes, the greater the opportunity to record nonlinear interactions.[10]

All neural networks for this paper were developed by the contractor who consulted with IRS during a one-week research contract. The contract provided that IRS would supply the data and consultants, and that the contractor would apply whatever procedures for neural computing he thought most appropriate to identify returns with significant yield and rank them for audit selection.

Very simple neural networks were recommended; each line item was an input, there was one hidden layer, and one output. The output was defined as the amount of tax change from the TCMP audit. For each of the four data sets (i.e. small business - Transformed Taxpayer Entries; small business - DIF Intervals; large business - Transformed Taxpayer Entries; large business - DIF Intervals), six neural networks

were developed, each with one to six nodes in the hidden layer. The neural computing technique selected was Back Propagation, and the learning rule was Extended Delta-Bar-Delta.[11]

The neural networks were developed through an iterative computer program. With each complete pass through the training data, processing stopped while the holdout test data was run through the trained network. The correlation of predicted to actual tax change was computed. If the correlation increased, the neural network was saved. Processing continued with another pass through the training data. The program recorded all correlations and saved the neural network with the highest correlation. Processing stopped when correlations did not increase for twelve consecutive passes through the training data. The neural network saved was designated the "best" network for that number of nodes in the hidden layer. Processing continued automatically for one to six nodes in the hidden layer. The six "best" neural networks were saved for each of the four data sets. Test data was scored by the six trained networks. The six sets of neural scores were sorted highest to lowest to estimate yield if alternative percents of the population were examined by highest neural scores.

Methodology — DIF

DIF formulas separate tax returns between two groups, one high yield, and the other low-to-no yield. The higher the DIF score, the greater the likelihood of membership in the high yield group. IRS traditionally uses all sample returns in its DIF formula development. Neural networks exclude a sizable number of returns as holdouts from network development for network validation. Excluding holdouts from model development for model validation is the practice most widely accepted. Contractors consulted by the task force questioned the IRS full-file formula development and recommended a technique to prove its validity. Tests of small and large business classes by the IRS task force resulted in validating the IRS practice of developing DIF formulas on entire classes, without holdouts.[12]

This issue was crucial to comparing methodologies. Modifying accepted DIF practice was necessary to most fairly compare results of the two methodologies; DIF was modified to accommodate the split-files required by neural networks. It was necessary to validate the accepted DIF practice of using full-files, for the split-file modifications to serve most effectively as surrogates.

Neural networks require holdouts to avoid overtraining. If neural networks were developed and evaluated on full-files (like the traditional DIF), seemingly impressive results would often not be repeated with new data as inputs. In this study, DIF formulas were developed on split-classes rather than on entire classes, so that inputs to DIF development and neural computing would be the same. To most fairly compare the two methodologies, DIF development and neural computing were performed on the training-half of each class, and validated on the testing-half.

Two DIF formulas were developed by the IRS task force, one for the small business class, and the other for the large business class. With the same 50 variables, the training-half of each class was processed once to develop a DIF training formula. The DIF training formula then "scored" the test-half, i.e. the training formula assigned a score to each return in the test-half. DIF scores for the test-half were sorted highest to lowest and expected results at alternative levels of coverage were compared with those for neural networks. DIF Tests and neural networks, though comparable for this study, were inferior to DIF formulas developed on entire classes and implemented nationally in 1993. Additional research showed that differences between DIF Tests and implemented DIF formulas were due largely to the random class-splits. Below 10 percent coverage, DIF Test results changed significantly for different random splits.[13]

Differences Between DIF And Neural Networks

The DIF methodology differs from neural computing in the following ways:

- DIF formulas are developed on weighted samples and reflect population characteristics. Neural networks disregard sampling weights during training, and may not reflect population characteristics.

- DIF does not require a holdout sample. Neural networks require class-splits between train and test sets to avoid overtraining; only half the sample participates in neural network development, the other half is for testing. The entire sample participates in developing a DIF formula.

- DIF formulas are very simple to implement. DIF scores involve adding a series of integers. Neural networks are far more complex. They involve thousands of decimal weights, hyperbolic transfer functions, and are implemented in a "black box" subroutine due to their complexity.

- DIF often begins with about 150 variables. Variables are removed iteratively, until a much smaller subset remains. Neural networks recommended no more than 55 initial variables. (Note: Variable reduction

was not attempted due to a one week time constraint. Network performance with fewer variables is unknown.)

- DIF excludes variables not contributing sufficiently to a developing formula. Neural computing lacks a ready, systematic technique for reducing the number of variables.

- DIF is linear and does not permit interactions among variables, whereas neural networks are nonlinear and do permit interactions among variables. Interactions might involve the effects of independent variables multiplied by one another.

- DIF formulas distinguish between likely membership in two groups, high yield versus low-to-no yield. Neural networks predict the amount of tax change.[14]

- DIF formulas are unique; only one solution best separates high yield and low yield sample returns. Neural solutions are not unique; there are many alternative solutions, and it is difficult to determine which is best.

Results Of Neural Networks And DIF Tests

Neural networks resulted in neural scores, and DIF Tests in DIF scores. Scores were sorted highest to lowest to simulate the expected results of auditing an increasingly greater percent of the population by highest scores. Each "percent" defined an alternative level of audit coverage. At each level of coverage, average tax increase, high change rate, and no change rate were recorded. Each of the three measures supported the same conclusions. Only the measure, "percent of returns with high yield" (the high-change rate), is reported in this study, and is displayed in Tables 1 to 4, and in Figures 1 to 8. The percent of returns with high yield was recorded at 20 levels of audit coverage. Audit coverage at 100 percent reflected the measures expected if all returns were audited, or if returns were selected at random for audit.

IRS typically operates at very low coverage levels. In 1992, audit coverage for the small business class was 1.49 percent, and was 3.95 percent for the large business class.[15] Point estimates at these rates were highly variable with only about 50 and 80 sample returns for small and large business classes, respectively. Variability was further increased with weighted test-halves representing entire classes. Over the years, when sample returns were small in number at coverage, higher coverage levels were often assigned as surrogates, and results were evaluated over a range of coverage levels. The selection systems were compared over a span of 20 coverage levels. The "Times Best" analyses, in Tables 1 to 4, focused on consistent superiority. Fifteen of the twenty levels of coverage were 10 percent and below, and included approximate coverage levels for all classes of all types of returns.

In Tables 1 to 4, at each level of audit coverage, the largest value for "percent of returns with high yield" appears underlined and in bold italics and indicates the "best" formula at that coverage level. Where several of the highest values were close, they were all considered constructively equivalent, and were underlined in bold italics. The number of times each network or DIF Test was best-at-coverage (at 20 levels of coverage) was recorded on the line labeled "Times Best". The greatest value for Times Best was boxed with double borders, as the best of the seven alternative scoring systems (i.e. the DIF Test or one of the six neural networks). The approximate sample and population sizes at each of the 20 coverage levels were displayed to convey relative precision.

There were, in effect, only two unique DIF Tests. One DIF Test for the small business class, and the other for the large business class. In Figures 1 to 4, DIF Tests were plotted against the best of the six alternative neural networks. In Figures 5 to 8, six neural networks were displayed to compare results of one to six nodes.

Tables and figures supported the following general observations:

- **Small Business Class, Neural Networks With Transformed Taxpayer Entries**
  The DIF Test was the best scoring system and the results of all six neural networks were very similar.
  (Table 1, Figure 1, and Figure 5)

- **Small Business Class, Neural Networks With DIF Intervals**
  The neural network with One Node was best. A one node network, however, is the same as logistic regression, a statistical technique. One node should not be considered a neural network, since it could be derived more simply with an alternative statistical technique. Results of all scoring systems were similar.
  (Table 2, Figure 2, and Figure 6)

Percent Of Returns With High Yield At Alternative Levels Of Audit Coverage

(Highest Values Are Highlighted At Each Level Of Coverage)

Table 1

Small Businesses With Transformed Entries

Audit Coverage	DIF Test	One Node	Two Nodes	Three Nodes	Four Nodes	Five Nodes	Six Nodes
0.5%	31.1	35.6	36.3	35.8	35.8	***44.1***	***44.3***
1.0%	***47.0***	36.5	37.6	35.7	29.6	31.7	31.7
1.5%	***46.9***	29.4	31.3	30.3	24.7	32.7	31.8
2.0%	***45.3***	26.2	27.3	23.3	27.5	28.7	29.4
2.5%	***40.8***	23.3	23.4	28.4	32.9	29.6	28.8
3.0%	***39.0***	24.9	23.5	25.1	27.5	29.1	29.4
3.5%	***37.9***	28.1	25.9	23.7	32.4	29.2	29.7
4.0%	***35.8***	28.4	28.8	30.2	***34.8***	31.5	31.4
4.5%	***34.0***	28.3	30.2	30.9	***33.0***	31.6	***33.0***
5.0%	***38.9***	30.9	30.3	30.5	32.7	30.8	31.2
6.0%	***40.1***	31.2	30.9	33.3	32.7	32.8	32.1
7.0%	***38.3***	30.7	31.4	35.5	30.8	34.2	34.2
8.0%	***36.5***	31.9	32.4	***36.8***	32.8	33.9	33.8
9.0%	***36.1***	30.1	33.6	32.7	34.0	32.6	32.0
10.0%	34.1	31.1	32.8	31.6	***35.2***	33.8	32.3
15.0%	***32.7***	***32.5***	30.6	30.9	30.9	30.9	30.6
25.0%	27.0	27.3	26.7	26.9	***27.5***	***27.8***	***27.8***
50.0%	***21.2***	20.4	20.4	20.4	***21.1***	***20.7***	***20.8***
75.0%	***15.6***	***15.9***	***15.6***	***15.8***	***15.6***	***15.8***	***15.7***
100.0%	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***
Times Best	17	3	2	3	7	5	6

Table 2

Small Businesses With DIF Intervals

Audit Coverage	DIF Test	One Node	Two Nodes	Three Nodes	Four Nodes	Five Nodes	Six Nodes
0.5%	31.1	***49.5***	39.2	27.2	36.5	32.5	46.3
1.0%	47.0	48.0	36.6	42.6	37.9	44.3	***49.9***
1.5%	46.9	45.7	43.4	37.5	33.4	***49.2***	46.6
2.0%	45.3	43.1	43.5	34.5	40.2	45.1	***46.5***
2.5%	40.8	44.9	42.0	39.6	36.4	45.3	***46.6***
3.0%	39.0	37.9	40.4	39.4	40.2	***44.3***	***44.5***
3.5%	37.9	38.9	40.0	40.8	40.9	***44.0***	***44.1***
4.0%	35.8	***42.3***	40.5	39.4	38.2	***42.5***	39.7
4.5%	34.0	39.3	***41.2***	36.2	37.4	39.4	39.4
5.0%	38.9	***40.2***	37.5	38.6	***41.1***	39.3	37.2
6.0%	***40.1***	***40.1***	37.5	37.2	38.1	37.3	36.8
7.0%	***38.3***	37.1	36.3	35.9	36.9	35.6	35.4
8.0%	36.5	***37.9***	37.0	35.2	35.3	35.2	36.0
9.0%	36.1	35.6	***37.1***	35.1	34.1	34.6	35.0
10.0%	34.1	***36.4***	***36.4***	***36.4***	***36.4***	***36.4***	34.3
15.0%	32.7	32.9	33.4	34.0	***35.1***	34.0	34.0
25.0%	27.0	***30.8***	***31.3***	30.4	29.8	29.9	30.3
50.0%	***21.2***	***20.8***	***20.5***	***20.9***	***21.2***	***21.0***	***21.0***
75.0%	***15.6***	***15.7***	***15.4***	***15.6***	***15.5***	***15.7***	***15.6***
100.0%	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***	***12.6***
Times Best	5	10	7	4	6	8	8

Test Set Approximate Frequencies... Population	Sample
4,500	20
9,000	35
14,000	50
18,000	70
23,500	85
28,000	100
32,500	115
37,000	130
42,500	140
47,000	155
56,000	180
66,000	210
76,000	235
85,000	260
95,000	290
142,000	400
237,000	600
475,000	1,100
700,000	1,500
951,432	1,865

Table 3

Large Businesses With Transformed Entries

Audit Coverage	DIF Test	One Node	Two Nodes	Three Nodes	Four Nodes	Five Nodes	Six Nodes
0.5%	***30.6***	***30.6***	10.1	NA	***30.0***	20.5	10.8
1.0%	***48.0***	33.7	33.7	NA	33.7	28.5	29.5
1.5%	32.7	29.2	***42.0***	NA	29.3	32.4	29.4
2.0%	29.3	31.2	***33.5***	NA	31.4	29.5	31.2
2.5%	29.1	***33.1***	***32.9***	NA	30.7	29.3	31.0
3.0%	28.7	***34.1***	32.2	NA	30.9	32.5	28.9
3.5%	27.4	***31.9***	***32.0***	NA	***33.2***	***31.9***	29.2
4.0%	27.7	***33.0***	29.3	NA	30.5	29.0	30.2
4.5%	***30.9***	***31.3***	30.2	NA	30.2	28.2	29.2
5.0%	***32.6***	30.1	28.3	NA	***32.2***	28.1	30.0
6.0%	***33.7***	31.5	***32.6***	NA	***33.1***	26.7	27.4
7.0%	***32.5***	***31.8***	28.9	NA	***31.8***	29.7	***31.1***
8.0%	***30.8***	***31.4***	28.5	NA	***30.1***	29.0	***30.2***
9.0%	***32.5***	27.9	26.2	NA	28.9	27.3	30.0
10.0%	***32.6***	27.4	25.9	NA	26.0	26.0	28.3
15.0%	***27.9***	25.1	26.5	NA	25.9	25.5	25.2
25.0%	***24.2***	22.2	21.8	NA	21.1	22.0	22.3
50.0%	***17.8***	16.8	17.1	NA	16.7	16.9	16.8
75.0%	***14.4***	***14.4***	***14.4***	NA	***14.2***	***14.3***	***14.3***
100.0%	***11.8***	***11.8***	***11.8***	NA	***11.8***	***11.8***	***11.8***
Times Best	14	10	7	0	8	3	4

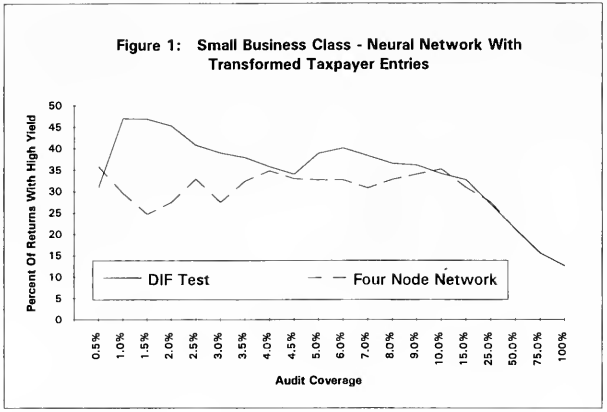
Table 4

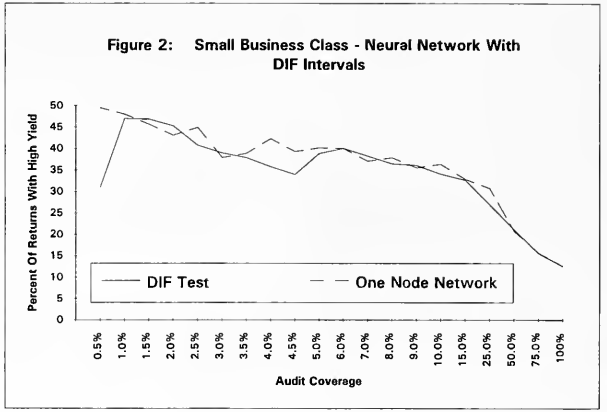
Large Businesses With DIF Intervals

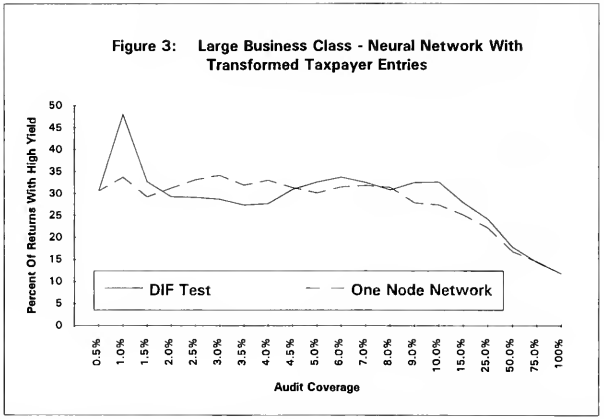
Audit Coverage	DIF Test	One Node	Two Nodes	Three Nodes	Four Nodes	Five Nodes	Six Nodes
0.5%	30.6	20.4	20.2	***41.0***	10.1	11.0	0.0
1.0%	***48.0***	25.9	35.8	36.1	25.9	31.3	20.5
1.5%	32.7	32.7	36.4	36.2	30.2	***39.5***	30.1
2.0%	29.3	36.7	35.1	***42.4***	37.4	37.7	37.5
2.5%	29.1	33.0	37.0	***41.7***	37.2	37.2	***40.8***
3.0%	28.7	35.9	***42.6***	***42.2***	39.3	38.5	37.4
3.5%	27.4	33.2	***44.2***	42.8	40.1	38.7	35.9
4.0%	27.7	29.2	***41.4***	***40.1***	36.4	37.7	37.6
4.5%	30.9	31.1	***39.7***	***39.7***	36.5	37.5	34.2
5.0%	32.6	33.9	***39.4***	***39.6***	33.5	36.7	34.5
6.0%	33.7	***35.2***	***36.0***	***36.1***	34.3	34.7	32.8
7.0%	32.5	33.7	***35.0***	***35.6***	***34.5***	30.1	30.8
8.0%	30.8	31.9	32.4	***34.1***	30.5	28.9	30.6
9.0%	***32.5***	32.0	***32.3***	***33.5***	29.6	28.2	27.6
10.0%	***32.6***	***33.0***	***32.1***	***33.0***	29.4	28.8	27.7
15.0%	27.9	28.1	26.0	***28.9***	27.2	27.6	27.6
25.0%	***24.2***	***23.6***	21.5	23.0	23.3	23.3	22.7
50.0%	***17.8***	***17.5***	17.0	***17.6***	16.9	17.2	16.8
75.0%	***14.4***	***14.4***	***14.4***	***14.3***	***14.2***	***14.2***	***14.3***
100.0%	***11.8***	***11.8***	***11.8***	***11.8***	***11.8***	***11.8***	***11.8***
Times Best	7	6	11	16	3	3	3

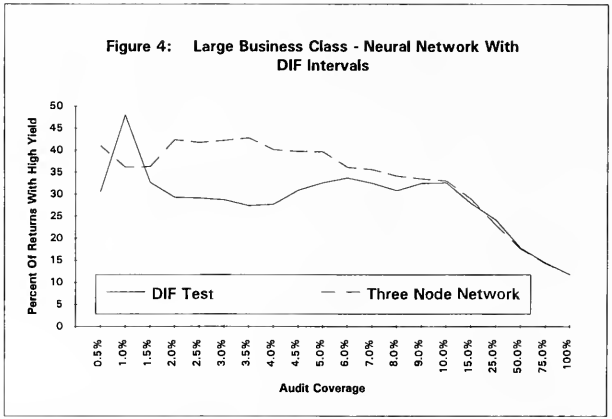
Test Set Approximate Frequencies... Population	Sample
3,000	10
6,500	20
10,000	30
13,500	40
17,000	50
20,000	60
24,000	70
27,000	80
30,000	90
35,000	100
40,000	125
45,000	150
50,000	175
60,000	200
75,000	225
100,000	300
175,000	550
350,000	1,100
525,000	1,650
684,479	2,192

Comparisons Of The Best Neural Networks With DIF Tests









Notes * In Figures 1 to 4, The Best Neural Network (Of Those Tested With One To Six Nodes In One Hidden Layer) Is Displayed With The Corresponding DIF Test.
* DIF And Neural Scores Were Sorted Highest To Lowest To Display The Percent Of High Yield Returns Expected At Alternative Levels Of Audit Coverage.

Neural Networks For Small And Large Business Classes

Figure 5: Small Business Class - Neural Networks With Transformed Taxpayer Entries

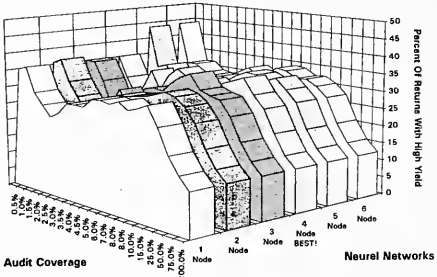


Figure 6: Small Business Class - Neural Networks With DIF Intervals

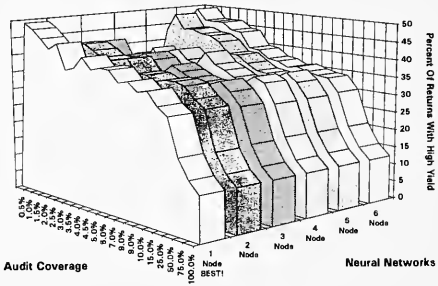


Figure 7: Large Business Class - Neural Networks With Transformed Taxpayer Entries

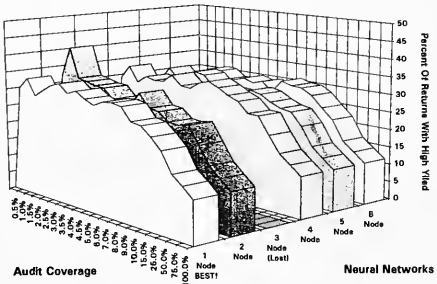
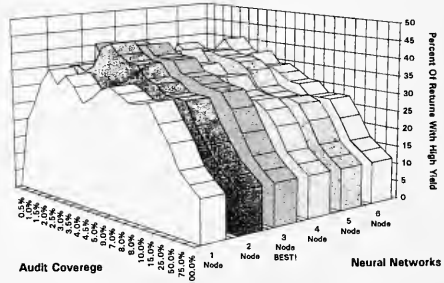


Figure 8: Large Business Class - Neural Networks With DIF Intervals



Notes:

- As Neural Networks Increased From One Node To Six Nodes, The Percent Of Returns With High Yield Did Not Increase Significantly.
- At Coverage Levels Less Than Ten Percent, DIF Intervals (Figures 6 and 8) Were Superior To Taxpayer Entries (Figures 5 and 7) As Inputs To Neural Networks .
- In Figure 7, the neural network with three nodes in the Hidden Layer is unavailable; data sets were destroyed prior to being recorded.

- **Large Business Class, Neural Networks With Transformed Taxpayer Entries**
  The DIF Test was the best scoring system and the results of all neural networks were very similar. (Note: the neural network with three nodes in the hidden layer was unavailable; data sets were destroyed prior to being recorded.) (Table 3, Figure 3, and Figure 7)

- **Large Business Class, Neural Networks With DIF Intervals**
  The neural network with three nodes in the hidden layer was the best, two nodes was a close second, and results of the other five scoring systems were similar. (Table 4, Figure 4, and Figure 8)

Observations

Neural Networks And DIF Tests Performed Well, With Similar Results.

About 10 percent of each class was defined as high yield returns. Thus, at 10 percent coverage, a perfect selection system would result in 100% high yield returns, compared to about 10 percent high yield, if returns were selected at random. At 10 percent audit coverage, results from neural networks and DIF Tests seemed to converge; over 30 percent of the test returns were high yield, triple the rate expected if audits were selected at random. Neural computing was expected to outperform DIF Tests at all coverage levels.

However, at less than 10 percent coverage, results improved with neural networks, but only if neural computing were done with DIF Intervals. For the large business class (Table 4 and Figure 4), the three-node network outperformed DIF at all coverage rates from 1.5 percent to 8.0 percent. Since actual examination coverage in this class has been about 4 percent in recent years, these results are interesting and suggest the value of further research in this area.

Significant nonlinear interactions did not occur.

Neural networks recorded nonlinear interactions among line items. DIF was blind to nonlinear interactions. Interactions were recorded at nodes in the hidden layer; the greater the number of nodes, the greater the opportunity to record interactions. Neural networks were expected to improve as the number of nodes increased from one to six. They did not. Neural networks with one or two nodes were similar to neural networks with three to six nodes. The nonlinear results from neural networks were generally no better than the linear results from discriminant function. Since evidence of nonlinear interactions could not be found, it appears that significant nonlinear interactions did not occur.

DIF Intervals Were Superior To Taxpayer Entries.

DIF Interval Data (Figures 6 and 8) were superior to Transformed Taxpayer Entries (Figures 5 and 7) as data set inputs to neural networks. This was unexpected. Neural networks were expected to recognize patterns predictive of high yield that had been lost during the aggregation of reported values into intervals. The contractor's Transforms of Taxpayer Entries were the best of six state-of-the-art alternatives, while the DIF Intervals were simply ranges. Neural networks improved significantly when taxpayer entries were aggregated into ordinal ranges.

DIF Intervals may have outperformed taxpayer entries because DIF Intervals reduce sample dependency. With sample dependency, estimates are affected by the unique features of a particular sample. If resampling were possible, it is expected that the broad DIF Intervals for each variable would remain largely unchanged. Broad DIF Intervals and interval statistics reflect population characteristics expected from ***any*** stratified random sample. Interval statistics replace taxpayer entries in DIF development, and analogous measures may have been derived by neural computing from interval membership. Broad interval membership appears a better indicator of tax change than taxpayer entries.

Limitations Of The Study

The contractor had access to IRS data only during the one-week of the research contract. Networks would likely have improved with more time to test neural alternatives. The contractor advised that networks representative of the neural methodology could be developed within the one-week time constraint. He expected improvements in neural networks as the number of nodes increased from one to six. Neural computing involves so many alternatives and variations, that this one-week study was but a foray into very complex terrain. Neural networks were compared with DIF Tests from a frame of reference limited by time and data. Interested researchers are encouraged to expand this limited frame of reference and to update the observations and conclusion.

Conclusion

Neural Networks are NOT recommended as an alternative to DIF, at present.

Results from neural networks were inferior to those obtained from IRS' implemented DIF formulas. In comparison with DIF formulas developed especially for this test, neural networks developed with standard data transformations were also largely inferior to DIF. However, neural networks developed on data transformations used for the DIF

methodology were more encouraging and performed better than DIF in certain coverage ranges for the larger business class.

Neural networks are much more difficult and much more expensive than DIF to implement and monitor as an operational IRS program. A DIF approach requires adding a series of integers. A neural network requires a complex and lengthy series of iterations involving transformations, multiplications, and summations. The computer processing often involves thousands of weights in a "black box" subroutine. Neural networks involved greatly increased costs and complexity without substantial additional benefits. Still, some results were encouraging, and further research into IRS applications of neural networks is encouraged.

Endnotes

[1]**Discriminant Function (DIF) Handbook**, Internal Revenue Service, Department of the Treasury, Document 6588 (Rev. 11-79), November 1979, pp. 1-2.

[2]**Discriminant Function (DIF) Handbook**, pp. 2-3.

[3]In the only outside review of DIF, the GAO concluded that "the higher the DIF score on a return, the more likely it is that an audit of that return will result in tax change. We believe that this analysis provides one of the more convincing arguments for DIF effectiveness." **How The Internal Revenue Service Selects Individual Income Tax Returns For Audit**, by the Comptroller General Of The United States, GGD-76-55, November 5, 1976, p. 34.

[4]The DIF Expert System was designed by the Exam DIF Team and built by the Workload Selection And Expert Systems Team at the Detroit Computing Center. It reduces the number of variables sequentially, and then displays the expected results of **all** DIF formulas for a range of variables competing for inclusion.

[5]A cross-functional IRS task force of operations research analysts was assembled in August 1992 to test alternative methodologies to DIF. The task force accomplished the following: (1) it compared neural networks with DIF, (2) it compared Classification And Regression Trees (CART) with DIF, and (3) it validated resubstitution in the DIF methodology. The task force consisted of Rick Griffith from the Detroit Computing Center, Jim Wilhelm from Research Division, and Lance Asner from the Office of the Assistant Commissioner (Examination). Members were very experienced with DIF and with statistical alternatives to DIF. They were familiar with neural networks and CART through formal training and through independent research.

A 1-week research contract was let with NeuralWare, Inc., to develop the best neural networks for small and large business classes. The task force observed and consulted with Dr. Casimir Klimasauskas, founder and CEO of NeuralWare, Inc., who developed the neural networks discussed in this paper. All IRS data was erased and tapes overwritten at week's end.

The task force also tested CART as an alternative to DIF. CART was developed in 1984, and is a statistical technique that identifies noncompliant groups of returns in terms of variable splits. A 3-day research contract was let with Dr. Charles Stone, Professor of Statistics, University of California at Berkeley, co-author of the CART methodology, to develop the best CART systems for small and large business classes. CART, by itself, did not perform as well as DIF. CART, combined with DIF, performed as well or better than DIF alone. CART was not recommended as a replacement for DIF, because, by itself, it did not show improvements, and could not sufficiently rank returns for audit. However, CART is still a viable technique to identify noncompliant groups among market segments. All IRS data was erased and tapes overwritten at the end of the contract.

Dr. Klimasauskas and Dr. Stone each questioned resubstitution in DIF; i.e. DIF formulas are evaluated with the same TCMP returns from which they were developed. Each questioned the validity of this approach and recommended withholding TCMP returns from formula development for formula validation. Dr. Stone recommended N-Fold Cross Validation to prove resubstitution. Ten-Fold Cross Validation was performed by the IRS task force. Results with holdouts were about 90 percent of implemented DIF formulas without holdouts. Resubstitution was validated, and a holdout sample is unnecessary. This is discussed more fully in endnote 12.

[6]NeuralWare, Inc., **Neural Computing, A Technology Handbook For NeuralWorks Professional II/PLUS and NeuralWorks Explorer**, Pittsburgh, 1993, pp. 9-16.

[7]In the III-10 TCMP sample of Individual returns processed during 1989, returns with and without a Schedule C were distributed as follows;

Class Groupings	With Schedule C	Without Schedule C	Totals
Nonbusiness(5)	6,838,178	90,917,005	97,755,183
Business(3)	5,713,212	0	5,713,212
Farm(2)	113,084	764,124	877,208
US Totals	**12,664,474**	**91,681,129**	**104,345,603**

[8]The topic of dollar yield from TCMP audits has been avoided as unnecessary and potentially misleading. The IRS task force evaluated neural networks and DIF Tests with respect to average tax increases, high change rates, and no change rates. Since each of the three measures supported the same conclusions, only the high change rates were included in this paper.

Configurations exist where comparisons of high-change rates alone would be misleading. For example, with 500 high-change returns in a sample of 5,000, similar but misleading high-change rates could result from two very different scoring systems; one that identified the 100 greatest high change returns, and the other that identified the 100 smallest high change returns. The former selection system would be superior to the later, average tax increase being much greater, although high change rates would appear similar. Although theoretically possible, this phenomenon has never been observed. Years of experience with DIF and other methodologies suggest that the greater the high change rate, the greater the average tax increase, at alternative levels of coverage, for competing selection systems. With neural networks and DIF Tests, this phenomenon certainly did not occur, as comparisons of high-change rates and average tax increases were closely associated and supported in the same general observations and conclusions.

[9]A data transform might involve dividing each taxpayer entry by the greatest absolute value for that line item, to rescale all entries between -1 and +1. **Neural Computing, A Technology Handbook**, pp. 71-73.

[10]**Neural Computing, A Technology Handbook**, pp. 1-5.

[11]**Neural Computing, A Technology Handbook**, pp. 63-85.

[12]N-Fold Cross Validation was recommended to prove the DIF methodology. It indicates how well a methodology will replicate. In N-Fold Cross Validation, a data set is randomly cut into "N" subsets of the same size. "N" formulas are developed, each with a different subset as a holdout. Each return participates in "N-1" formulas, and is a holdout from one formula. Returns are scored by the formula in which they did not participate, and are sorted by standardized scores.

Ten-Fold Cross Validation was applied to small and large business classes. Ten DIF formulas were developed with a different 10 percent withheld from each formula. Holdouts were scored by the formula in which they did not participate. For this experiment, formulas were developed automatically, without the time or refinements devoted to the formulas implemented nationally. Variables were reduced in number to those of a typical DIF formula. Results were about 90 percent of implemented DIF formulas. Cross validation with holdouts was very similar to DIF without holdouts. Thus, it is unnecessary to withhold TCMP returns for formula validation; full-file resubstitution is valid.

Resubstitution is supported in statistical literature on discriminant function; Cooley and Lohnes **Multivariate Data Analysis**, (New York: John Wiley, 1971), p. 262 states that "only when the research samples are large and carefully randomized will classification of their members be a convincing display of the classification validity of the measures." "Classification validity" refers to the successful assignment of new observations as good-to-audit or not-good-to-audit. Since the TCMP sample is "large and carefully randomized," a holdout sample is unnecessary.

[13]DIF Tests were affected by the random class-splits; it was shown that different splits of the same class produced different results. Ten additional random class-splits were completed on the small and large business classes. This was an adjunct to the cross validation discussed in endnote 12. The two class splits in this paper were Two-Fold Cross Validations. Ten additional Two-Fold Cross Validations were performed by the IRS task force. DIF formulas were developed on each half of the 10 splits. Each formula assigned scores to the returns which did not participate in the formula development. DIF scores were standardized and averaged across the TCMP returns. Average measures were about 85 percent of DIF formulas implemented nationally in 1993. Formulas were developed automatically by computer, with variables reduced in number.

Results from all 10 splits were similar at 10 percent coverage and higher. At levels of coverage below 10 percent, four of the ten splits showed improved results (much like the small business DIF Test in Figure 1 or 2). Six of the ten splits were largely constant at levels of coverage below 10 percent (much like the large business DIF Test in Figure 3 or 4). Although **average** measures below 10 percent coverage were close to full-file results, results of **individual** DIF Tests were usually much different than the full-file results, and appeared affected by the random split.

[14]The correlations between predicted tax change and actual tax change among test returns were no greater than R^2=.41 for small business classes and R^2=.29 for large business classes.

[15]Department of the Treasury, **Internal Revenue Service 1992 Annual Report**, Publication 55, p. 34.

Baselining IRS' Software Portfolio Using Function Point Estimators

by Charles B. Tichenor

The IRS performed a baseline measurement of the size and complexity of its tax collection system software portfolio using the function point analysis concept. Typically, it requires one or two days to conduct a function point count of an average sized project using the International Function Point Users Group (IFPUG) counting standards, the official standard adopted by the IRS. IRS has numerous software projects and few qualified function point counters making it too time consuming for IRS personnel to conduct the baseline count and too expensive to contract for that counting. Thus, we tested a "fast count" method developed at the McDonnell Douglas Corporation which estimates function point counts in about one-third of the time and with almost negligible margins of error. The fast count estimate differed from the corresponding IFPUG method count by only 0.49 percent. Therefore, IRS provisionally accepted the fast count method as an acceptable way to estimate function point counts of IRS projects.

Introduction

The task to process tax returns for every filer in the country is exceptionally large and complex. Even using automation, the task is still so large and complex that it is subdivided into several hundred subtasks. These subtasks are organized and managed as a portfolio of software projects. In general, an IRS software project is an effort to provide a product and/or service to customers and other stakeholders according to certain specifications and applicable standards. For example, the Individual Master File has responsibilities which include storing the tax return information submitted by all individuals filing tax returns.

Although we know that IRS' tax return processing software portfolio is exceptionally large and complex, we do not yet have a measurement of how large and complex it actually is. Such a measurement can be made through function point analysis. By summing the function point counts of all projects, we will know the size and complexity of our tax collection software portfolio. This measurement is important for our ability to continuously improve our operation of the tax system.

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What are Function Points?

We describe a function point as a deliverable which the software project provides for its customers. For example, word processing packages typically provide their customers such deliverables as choosing margin widths, using automatic page numbering, and selecting one among several printers for output. These and other kinds of deliverables can be counted using function point methodology. The more customer requirements which are delivered by a software project, the higher the function point count will be. A project having 500 function points is considered twice the size and complexity as a project having 250 function points. This measurement is independent of the programming language(s) used and number of lines of code used in the software project.

Counting Function Points

The IRS has chosen the International Function Point Users Group (IFPUG) function point counting method as "the only acceptable function point counting method for individual (IRS) projects."[1] In our experience, it requires 1 or 2 days for a team of three people to conduct an IFPUG method function point count for an average sized IRS software project. Since there are approximately 500 projects, a baseline function point count for IRS' tax collection software portfolio would require a lengthy time frame and either a large staffing commitment or an extraordinarily high cost contract for vendor counting support. Thus, we sought an alternative method for estimating function point counts.

In the software industry, many companies use methods which estimate function point counts. Although they typically result in a function point count estimated quickly, they do not necessarily have a low margin of error inherent in the estimate. One statistical measure of margin of error is the correlation coefficient, represented by the letter "r." The correlation coefficient is a decimal measure with an absolute value ranging from 0.0 to 1.0. It represents how well two variables seem to be related. For example, if it is known that the length of a side of a square is 2, then it is certain that the perimeter is 8. The correlation between the side of a square and its perimeter is 1 (i.e., r=1.0). An r value of 0.0 means that there is no correlation between the two values. For example, there presumably is no correlation between the amount of rainfall on one continent and the production of automotive parts on another continent. A good function point estimation methodology, therefore, will quickly generate estimates from a model with an r value close to 1.0. This

would indicate a good correlation between the estimated number of function points per the model and the actual number of function points.

The estimation methods currently used in the software industry induce margins of error prohibitively large for IRS' baselining needs. However, a very promising "fast count" estimation method was developed recently at the McDonnell Douglas Corporation called "function point—simplified" or "FP-S."[2] FP-S provided McDonnell Douglas very close estimates of corresponding IFPUG method function point counts. The counts realized an r value of 0.99—almost perfect correlation (and an almost negligible margin of error). Also, the time required for them to produce an FP-S estimate was as little as 20 percent of the time they required for an IFPUG method count.

The FP-S Method

Each software project's function point count consists of five "function types": external input, external output, external inquiry, internal logical file, and external interface file. One of the most time consuming stages of a function point count is determining a low, average, and high complexity rating for each of the five function types. For example, loosely stated, one must determine not only how many external inputs belong to a project but also, for each external input, how many data fields are input and how many internal logical files these data fields update.

McDonnell Douglas found that the proportion of low, average, and high complexity ratings for their external inputs was roughly the same from project to project in their sample. They reasoned that if these proportions were usually the same throughout their sample, then they could replace the corresponding IFPUG method weights for low, average, and high complexity external inputs with a single "weighted average" for the three. Then, only the number of external inputs needed to be counted and the time otherwise needed to collect information about their data fields and file types referenced did not have to be spent. They also applied the same kind of thinking to their external output, external inquiry, internal logical file, and external interface file function point complexity ratings and derived "weighted averages" for each of these function types. By using their "weighted averages" instead of the IFPUG complexity matrices, McDonnell Douglas achieved a function point estimating time of about 20 percent of their corresponding counting time.

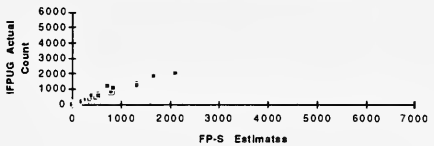
The Appendix shows a complete step by step description of how to produce the FP-S estimate.

IRS Modification of FP-S

Realizing that FP-S might meet the requirement of providing fast and accurate estimates, we wanted to determine if FP-S estimates yielded an acceptable margin of error. Also, we wanted to determine if a slight modification to the FP-S algorithm was necessary to reflect a differences in the organizational cultures of McDonnell Douglas and the IRS.

We first derived FP-S estimates from a random sample of 33 IRS projects which had been counted previously using the IFPUG method. We also included a "null project" in the data set—if a project has not yet generated any function points, then both the FP-S estimate and IFPUG count must yield zero function points. Knowing this data point for certain is important for the upcoming statistical analysis. Figure 1 shows the plot of these 34 data points.

Figure 1
FP-S Estimate vs. IFPUG Count



After plotting the data points, we compared the FP-S estimates with the IFPUG counts using several statistical models. One of these models might then be used to convert the function point estimates compiled by the FP-S method into its equivalent IFPUG counts.

The first statistical test used was the nonparametric Spearman test for correlation. It simply measured correlation between the FP-S estimates and actual IFPUG counts. The calculated Spearman correlation coefficient was extremely strong (.9866) and the test was significant for an alpha level of .005.

The second test used linear regression which produced a resulting r value of .9949. As good as this r value was, this model's estimated regression line had a y-intercept of 44 function points. In practice, this meant that if using FP-S we determined a project's function point count to be zero, then we would estimate its IFPUG count to be 44 function points. Our model should have estimated that IFPUG count to be zero. This unfavorable situation caused us to rule out this model.

The third test used linear regression through the origin because the true regression equation is known to include the point (0,0). The resulting r value was .9942.

The fourth test used a non-linear regression technique and produced the most favorable results. The resulting r value was .9985, and the equation contained the origin of zero. Since this model had a slightly higher r value than the linear regression through the origin model, it was eventually approved as the best model. The resulting equation was as follows:

$$IFPUG = 1.063 * (FP\text{-}S)^{1.0024}$$

Using the IFPUG counting method, those 34 projects contained 21,963 function points. The corresponding fast count using this model's equation was 22,071—a difference of .49 percent.

Conclusion

Based on our tests, the fast count method clearly provides accurate estimates of function point counts. It is now in use by the IRS and is applicable to most IRS project types. As of December 1993, we completed about 180 function point counts, 97 using the fast count method. Substantial staff time savings were realized as we found the fast count method to be four times faster than the explicit IFPUG method.

Endnotes

[1]Internal Revenue Service **Project Management Guide Version 2.1**, Washington, D.C., pp. 8-23.

[2]Bock, Douglas B. and Robert Klepper, "FP-S: A Simplified Function Point Counting Method," **The Journal of Systems and Software**, July 1992, pp. 245-254.

Appendix

For readers desiring more information on the FP-S algorithm, it is briefly described below. The FP-S method is also taught in the IRS Project Management Training Program class "Function Point Analysis I."

1) Count the number of internal logical files.

2) Disregard the associated complexity matrix and associated weighting factors.

3) Multiply the total number of internal logical files by the McDonnell Douglas weighting factor of 8.41 and use this number as the estimated unadjusted "internal logical file" function point count.

4) Continue the estimation process by counting the number of individual external interface files and multiplying by 5.54.

5) Count the number of external inputs and multiply by 3.18.

6) Count the number of external outputs and multiply by 5.33.

7) Count the external inquiries and multiply by 3.92.

8) If there are super files, invoke the super file rule.

9) Use the IFPUG methodology to compute the "Total Degrees of Influence" factor as usual and compute the "Value Adjustment Factor."

10) Multiply the sum of the estimated individual unadjusted function point counts by the value adjustment factor to produce the FP-S function point estimate.

11) To convert FP-S into an IRS function point fast count estimate, use the following conversion formula:

$$IFPUG = 1.063 * (FP\text{-}S)^{1.0024}$$

Abstracts are summaries of studies completed since September 1992. The authors' group and division names reflect the organizational structure that was in place at the time the study was completed. Since the reorganization of IRS National Office, Research Division has been renamed National Office Compliance Research.

Bonnie L. Nichols
Andre F. Palmer

Calendar Year 1993 Individual Tax Return Shortfall

April 1994
Projections and Forecasting Group
Research Division

The drop in the number of individual returns filed in 1993 is attributed to three primary factors.

Contradicting the expected trend, the total number of individual returns filed in calendar year 1993 (i.e., the sum of paper and electronic Forms 1040, 1040A, 1040EZ and 1040PC) fell 0.8 percent to 113.8 million—the first such decline since 1976. An analysis by Research staff indicated that the return shortfall was about 2 million fewer returns than would otherwise have been expected based on recent prior trends. The analysis also indicated that three factors largely contributed to this shortfall. They were: IRS' Reduce Unnecessary Filings program; an unprecedented drop in interest rates that caused the income of certain individuals to fall below the filing requirement threshold; and the March 1992 change in the withholding rates which reduced the amount of taxes withheld from employees' wages and which apparently left some individuals with an unanticipated balance due they were unable to pay and they elected not to file as a result. The magnitude of the shortfall attributable to each of these three factors was roughly the same.

Joel B. Friedman

Trust Fund Compliance Study

February 1994
Collection Research Section
Office of Assistant Commissioner (Collection)

The effect of the special training on trust fund delinquencies is inconclusive.

This study analyzed whether special training for IRS Revenue Officers increased the paying and filing compliance of taxpayers with trust fund (i.e., employment) tax obligations. The training involved working trust fund delinquencies according to strict Internal Revenue Manual procedures.

Test and control groups of taxpayers with payment (i.e., TDAs) or filing delinquencies were established. The test group was worked by revenue officers who had received the special training.

On the first subsequent tax period to show activity after the test group was selected, 79.6 percent of these taxpayers had not resolved their delinquencies and were issued a delinquent return or balance due notice. Of these, 53.6 percent required revenue officer intervention. On the second subsequent tax period to show activity, 71 percent of the test group taxpayers had not resolved their delinquencies and were issued a delinquent return or balance due notice. Of these, 36.8 percent required revenue officer intervention. These percentages were not significantly different from those for the control group and the effect of the special training on trust fund delinquencies was considered inconclusive.

Ross R. Saberin

Analysis of Notice 948 and Form 9433/9465 Installment Agreements: 1990-1992

November 1993
Collection Research Section
Office of Assistant Commissioner (Collection)

Liberalization of installment agreements results in reduction of up-front dollars collected.

Using Collection Research File data, this study analyzed the effect of Notice 948, an installment agreement (IA) solicitation stuffer that is included with the third IDRS Notice (503), and the related Forms 9433 and 9465 during 1990-1992. The analysis showed that average dollars collected per taxpayer within the 6 weeks immediately after the third notice has been sent consistently declined each year since 1990. The data indicated that the decline resulted from taxpayers taking advantage of liberalized installment agreement offers, thereby reducing the up-front dollars collected.

Helen Choi

Recovery of Dollars From CY 1987 Deferred Tax Modules

September 1993
Collection Research Section
Office of Assistant Commissioner (Collection)

For business taxpayers, approximately 67 percent of dollars deferred in CY 1987 were paid and credited after net adjustments by April 1993. For individual taxpayers, 86 percent were paid and credited after net adjustments by January 1992.

A sample of balance due cases for business taxpayers that were initially deferred from taxpayer delinquent account (TDA) status in calendar year (CY) 1987 was analyzed. This analysis covered activity from 1987 to April 1993. The results showed that approximately 69 percent of these cases were full paid or reactivated out of deferred status in 2 years, and 84 percent in 5 years. Approximately 38 percent of the dollars were collected while in deferred status within 2 years after deferral. By April 1993, approximately 67 percent of the CY 1987 deferral issuance dollars, regardless of which status they were in at that time, were paid and credited after net adjustments.

A similar analysis on balance due cases for individual taxpayers that were deferred was previously conducted. This analysis covered activity from CY 1987 to January 1992. It showed that approximately 72 percent of these cases were full paid or reactivated out of deferred status in 2 years, and 88 percent after 5 years. Approximately 30 percent of the dollars were collected while in deferred status within 2 years after deferral. By January 1992, approximately 86 percent of the CY 1987 deferral issuance dollars, regardless of which status they were in at that time, were paid and credited after net adjustments.

Helen Choi

Accelerated Notice Process (Elimination of Notice 502) Study

August 1993
Collection Research Section
Office of Assistant Commissioner (Collection)

The study indicates that eliminating the third balance due notice to individual taxpayers has minimal impact on the collection of delinquent taxes.

A study was conducted to determine if eliminating one balance due notice to individual taxpayers (specifically the third notice), and thus shortening the balance due notice process by 5 weeks, would have a negative impact on the collection of delinquent taxes.

The third notice was systemically eliminated in three test districts (Albany, Indianapolis and Des Moines) for 6 months, from August 1991 to January 1992. Each test district was compared to several comparable districts under the same service center. We tracked the activity for all test and control groups from the time of the second notice up through April 1993.

Our findings indicated that eliminating the third balance due notice and shortening the notice process by 5 weeks for individual taxpayers had minimal impact on the collection of delinquent taxes in terms of: dollars collected; type of disposition for the case; length of time to disposition for the case; and subsequent filing compliance of the taxpayer.

Ivette Y. Alamo-Tirado

Analysis of High Income Nonfilers

July 1993
Collection Research Section
Office of Assistant Commissioner (Collection)

High income nonfilers were profiled regarding average tax liability, income and other characteristics.

An analysis was conducted to profile the characteristics of high income nonfilers. High income nonfilers are individuals who have Information Returns Program documents showing income greater the $100,000 and have not filed their U.S. Individual Income Tax Return (Form 1040). A return has been secured on 188,811 of those identified as of April 16, 1993. Key findings of the secured returns include: (1) the average taxpayer age is 45 years old; (2) the average tax liability and total positive income are $27,987 and $180,448 respectively; (3) so far, $671.5 million has been collected including withholding and $444 million has been refunded; (4) 38 percent are refund balance due, with an average refund amount of $9,903; (5) 52 percent have an average balance due amount of $18,054; (6) 49 percent filed with a Schedule C and/or Schedule F; (7) 20 percent sent in a remittance averaging $8,672 with the return; and (8) remittance dollars count for 31 percent of the money collected.

Drusilla DeLong

Excise Tax (Diesel Fuel and Gasoline) Focus Groups

September 1992
Statistical and Opinion Research Group
Research Division

Excise tax focus groups recommended more cooperation between states and IRS and strengthening the examination program by making use of industry experts.

From March through June 1992, Research Division conducted focus groups with participants from the oil industry who are registered on IRS Form 637, Registration for Tax-Free Transaction Under Chapter 32 of the Internal Revenue Code. Discussion centered on current program administration and non-compliance with existing laws and regulations. Previously, two internal focus groups were conducted in October 1991 with revenue agents representing all regions. These focus groups were conducted around the country as part of a joint Assistant Commissioner (Examination) and Assistant Commissioner (Planning and Research) initiative with respect to federal excise tax on gasoline and diesel fuel.

It was generally perceived that compliance with gasoline excise tax laws is much higher than diesel tax laws. Many problems are caused by inconsistency among districts in the interpretation and application of excise tax and regulations. It was thought that more cooperation between states and the IRS would improve compliance. Participants noted a weakness in the examination program, and thought that the IRS should make use of industry experts.

Fred R. Riley

Estimates of Filers Eligible to File a Proposed Form 1065EZ (A Simplified Form 1065)

March 1994
Projections and Forecasting Group
Research Division

Research Division estimates indicate around 4 percent of all partnerships could file a simplified Form 1065EZ and that 60 percent of those eligible would do so.

At the request of the Tax Forms and Publication (TF&P) Division, Research Division developed estimates of filers eligible to file a proposed Form 1065EZ (a simplified Form 1065). Based on eligibility criteria provided by TF&P Division, Statistics of Income Division data were used to estimate the number of 1065EZ returns "filed" in 1992 and 1993. Research staff then forecasted eligible Form 1065EZ filers out to 1996 assuming that, as indicated by the SOI data estimates, 4 percent of all partnerships could file this form.

Research Division also estimated the number of filers who would actually file a simplified Form 1065EZ based on IRS' experience with the Form 940EZ. That experience suggests that approximately 60 percent of all eligible filers would switch to the new Form 1065EZ. However, this experience also suggests that a mail-out targeted at Form 1065EZ filers could raise the participation rate above the 60 percent level.

Nichole Kamman

Estimates of Additional Forms 1040EZ to be Filed in CY 1995 Via TeleFile If Taxpayers With Pension Income, Over 65 and Blind Became Eligible

November 1993
Projections and Forecasting Group
Research Division

Estimates indicate that an additional 1.8 million return filers would be eligible to file Form 1040EZ in CY 1995 if taxpayers with pension income, over 65 and/or blind became eligible, with 0.3 million of those choosing TeleFile.

We estimated the number of additional return filers eligible to file Form 1040EZ if taxpayers with pension income or claiming exemptions for over 65 and/or blind became eligible to use the form. We assumed no other changes in the eligibility criteria for filing Form 1040EZ, and that married filing joint taxpayers who met the new CY 1994 criteria were eligible to file the form.

Using the Statistics of Income (SOI) TY 1990 Individual/Sole Proprietor file, we selected and tabulated returns having the characteristics of interest. These numbers were then projected to a CY 1995 level using Research Division's most recent projections of individual returns (Document 6187, Rev. 9-93). We then applied the national participation rate projected for TeleFile returns in CY 1995 and discounted the resulting number to reflect the percentage of filers who historically continue to file more complex forms when eligible to file simpler forms.

The estimates indicated that an additional 1.8 million return filers would be eligible to file Form 1040EZ in CY 1995 with 0.3 million of those choosing the option of TeleFile.

Edward F. Emblom
Carolyn D. De Wilde

Results from Focus Group Interviews: Form 1099 Information Returns

July 1993
Economic Analysis and Modeling Group
Projections and Forecasting Group
Research Division

Taxpayers suggested mandating some degree of uniformity in the format of substitute Forms 1099, eliminating carbon printed forms and using consistent language on the forms and instructions.

Individual taxpayers receive over 1 billion information return documents yearly. Since most taxpayers receive at least one information return, their input was considered critical in determining whether the current system should be changed. At the request of the Assistant Commissioner (Examination), Research Division moderators conducted a series of nationwide focus group interviews with taxpayers. The results of the focus group interviews will be used by the IRS to finalize plans on uniformity issues for the various Forms 1099.

Participants made the following suggestions for improvements: mandate some degree of uniformity in the format of substitute Forms 1099; mandate location of form number and title; eliminate carbon printed forms (numbers become smudged); and use consistent language on the forms and instructions.

David C. Gow

Hispanic Focus Groups in the Los Angeles District

April 1993
Assistant Regional Commissioner (Data Processing)
Western Region

Hispanics recommend against tax forms in Spanish, but suggest more bilingual assistance, and changes in audit procedures and outreach programs. They volunteered to assist the IRS.

In the next decade the Hispanic population of Los Angeles, now over 3.3 million, will grow forming the majority of residents and individual filers. To assess the impact of this demographic shift, the Western Region Diversity Board initiated six focus groups. The participants were Hispanics employed in tax preparation, law, media, business, education or community service.

Participants expressed the view that Hispanic culture and experience created mistrust of government, an assumption that tax rules are changeable, and a strong proclivity to use intermediaries when it is not possible to avoid contact with the government. Participants also commented that the IRS has a poor image with Hispanics. Tax and filing problems are caused by immigration and language issues. Incompetent or fraudulent tax preparers are a serious and widespread problem.

Participants felt bilingual employees are much more useful than forms and publications in Spanish. Current taxpayer education and outreach are ineffective in the Hispanic market. Education and outreach need to be available year round, tailored to the Hispanic market, and use the volunteered assistance of the Hispanic media and community organizations.

The report recommends that the district: (1) increase support for legitimate preparers; (2) review certain audit practices and its general utilization of bilingual employees; (3) explore cultural awareness training; (4) form a Hispanic advisory panel; and (5) implement a new and full time program for Hispanic education and outreach.

Mary-Helen Risler
Barbara Draper

Form W-2 Wage and Tax Statement Focus Groups

February 1993
Economic Analysis and Modeling Group
Research Division

Focus group participants said the 1993 version of Form W-2 allowed them to find information quickly.

Research Division conducted six focus groups with approximately 60 individual taxpayers to obtain information and input on proposed revisions to the Form W-2, Wage and Tax Statement for Tax Year 1993. These groups were requested by the Executive Director, Information Reporting Program on behalf of the Implementation Team to Increase Uniformity of Forms W-2 and 1099.

All but two of the participants preferred the proposed tax year 1993 version to the tax year 1991 version. One of the most important reasons was the placement of what the participants considered the most important tax information, wages and federal income tax withholding, in boxes labeled 1 and 2, respectively.

Many participants said the 1993 version allowed them to find information quicker. The group members offered the following suggestions for improving the Form W-2: adding headings to the information areas, using larger print, moving the employee name and social security number to the top of the form, adding additional bold-line highlighting, using carbonless paper, and eliminating unnecessary information.

Drusilla DeLong

Unnecessary Filers Focus Groups

February 1993
Statistical and Opinion Research Group
Research Division

Unnecessary filers focus groups gathered taxpayers' reactions to IRS letters notifying them that they had been filing unnecessarily

Research Division conducted focus groups with taxpayers who filed an individual tax return when none was required. The groups were conducted at the request of the Returns Processing and Accounting Division as a follow-up to their 1991 study (see *The IRS Research Bulletin* 1992, "Reduce Unnecessary Filings (RUF) Project"). Among the objectives of the focus groups were: to gather reactions to a letter sent to unnecessary filers in the Philadelphia area notifying them that they had been filing unnecessarily; and to explore more effective means of communicating with them.

Participants reacted positively to the letter, and generally felt relief from the burden of filing. They preferred to receive some form of yearly communication from the IRS, however. Several participants who continued to feel uncomfortable with the idea of not filing a yearly return expressed fear and distrust of the IRS, and felt they couldn't be convinced not to file. They were willing to explore alternative methods for filing—methods which provide written documentation were preferred.

Derl A. Combs

Notice Clarity Focus Groups

December 1992
Compliance Research Group
Research Division

Notice clarity focus groups offered suggestions to remedy the vague or confusing areas of three IRS notices to taxpayers.

At the request of the Taxpayer Ombudsman's office, Research Division conducted eight focus groups in three cities to examine the taxpayers' perceptions and opinions regarding the clarity of three IRS notices: Math Error Notice (CP12), Third and Final Balance Due Notice (CP503), and Underreported Income Notice (CP2000). The groups were also conducted to seek taxpayers' views on areas of the notices that require change; the deletion of superfluous information from the notices; the aesthetics of the wording of the notices; and the complexity of the presentation of the notices.

Participants wanted a specific telephone number and a person to contact listed on notices mailed by the IRS in order to discuss specifics with someone who was knowledgeable about the issue. They did not want the standard toll-free number for Taxpayer Service.

Participants thought that the messages conveyed by these notices were clear and easy to understand, but the tone of the notices needed to be more positive. The participants identified areas of the notices that were vague or confusing and offered suggestions on how to remedy those areas.

Tamitha McFarland
Charles B. Tichenor

Developing a Model for Staffing IRS Software Development Project Offices

March 1994
Quality Measures Implementation Task Force
Office of Chief, Information Systems

The study found a direct relationship between function point counts for new development software projects and staffing usage.

This pilot study examined the relationship between the function point counts (a measurement of the size and complexity of a software project--see related article in this edition of *The IRS Research Bulletin*) and the staffing usage of those projects. A random sample of new development software projects of various sizes was studied to determine their function point counts and their corresponding staff months used (considered to be the minimum overhead needed for a project). The staff months used for the project were counted from the time the project "really got started" to implementation. They included all the time required by the project office staff—including the programmers' time, secretarial time, Project Manager's time, etc.—except for time used by a project planner and the time needed to prepare end-user documentation.

The study indicated that the relationship between function point counts and staffing usage was statistically significant in this sample. The five available data points were tested using regression analysis against 25 selected curves. The best "fit" seemed to be a linear model which had a high coefficient of determination (.9647). The linear model was also intuitively sensible—as function points increase, staffing usage also increased at a corresponding rate.

Jesus M. Mena

Account Receivables Classified Project: Phase I Research Report

February 1994
District Office Research and Analysis Group
San Francisco District

An analysis of current district accounts receivable dispositions using machine learning software has resulted in the development of models capable of predicting the probability of collection on tax delinquent accounts.

The District Office Research and Analysis group in San Francisco developed models that score accounts on the probability of collection and on the probability of full immediate payment for both individuals and business Tax Delinquent Accounts. The models use information obtained from the Fresno Service Center on their Tax Delinquent Account closed cases. The analysis involves the use of a clustering algorithm and statistical analysis for feature extraction.

The models rely on an analysis of multiple attributes for their predictions, such as the age of the account, the number of modules, the type of taxpayer, etc. The models are adaptive to demographic and economic trends within the district because they use very current and local data. The models average error rate is currently 15 percent, that is, the models are correctly classifying collectibles and full pay accounts on 85 percent of the test samples.

Mathew J. Ferrero
Catherine Lunderville

Fostering Employee Involvement and Creativity in the IRS

November 1993
Resources Management Division
Laguna Niguel District

Laguna Niguel and San Francisco District offices are successfully using Juran Project Teams to improve daily work activities.

This study provides an overview of the Total Quality Management environment in the Internal Revenue Service Western Region, and describes the successful use of Juran Project Teams in several district offices. Examples include streamlining the tax account adjustment process and simplifying the tax form used for reporting partnership income information.

In addition, the study reports on two types of high involvement work teams currently utilized in Western Region offices (Laguna Niguel and San Francisco) to promote TQM principles. Both teams evolved from several years experience with Juran project teams. Laguna Niguel District "Impact Teams" are existing work units with the manager as team leader. A group decision-making model and process analysis are employed to improve daily work processes. San Francisco District is testing several self-directed work teams of compliance officers for processing difficult field collection cases. The positive results realized from these teams include enhanced communication skills, strong employee interest in self-improvement, increased buy-in and skills for using quality tools creatively, and an improved labor relations climate.

Nichole Kamman
Carolyn D. De Wilde

The IRS Research Bulletin: Its Value and Future Direction

July 1993
Projections and Forecasting Group
Research Division

A study revealed that IRS executives and other internal customers overwhelmingly viewed the Bulletin as a "core" product in line with the IRS Strategic Business Plan which met their needs in its current form. However, some changes were recommended for improvement.

In the spirit of quality, we reviewed the value of *The IRS Research Bulletin* to internal customers. The research methodology included interviews with IRS executives, interviews with public affairs officers and Compliance 2000 coordinators, a customer survey, and a survey of authors of past *Bulletin* articles.

Executives and other customers overwhelmingly viewed the Bulletin as a "core" product in line with the IRS Strategic Business Plan. Executives described the current purpose of the *Bulletin* as appropriate, and saw the information it presented as a tool for achieving the objectives of the Strategic Business Plan. Ninety-four percent of customer survey respondents found the *Bulletin* useful and many expressed its important role in their work.

However, the review also found that the *Bulletin* was not reaching all agents of change in the organization due to a lack of publicity. Interviewees suggested publicizing the *Bulletin* more extensively through existing channels of internal communications. Also, many found that the *Bulletin* presented too much information to digest at one time. Executive-type summaries or more frequent publications containing less information were suggested.

William J. Lipsett
Alan R. Field

Measuring Customer's Satisfaction With ISM Software

July 1993
Quality Measures Implementation Task Force
Office of Chief, Information Systems

Questionnaires and structured group interviews were found to be worthwhile tools for measuring customer satisfaction with ISM software.

In line with the IRS Strategic Business Plan, the IRS Information Systems (formerly ISM) function established the Quality Measures Implementation Task Force (QMITF). To test the idea of measuring internal customer satisfaction, QMITF identified software ISM had developed for three pilot projects and the internal customers associated with the software. The satisfaction of these customers was then measured using survey questionnaires and structured group interviews (similar to focus groups). Participants' views were solicited regarding the value of the questionnaires and interviews.

Participants generally agreed that the questionnaires and structured group interviews were worthwhile. They clearly appreciated the opportunity to express their views on ISM produced software, and the process allowed them to provide thorough and comprehensive suggestions for software improvement. QMITF determined that the benefits of measuring customer satisfaction included establishment of numerical and graphic measures of quality, opened lines of communication within projects and across functional areas, and identification of areas for improvement. QMITF also determined that internal customer satisfaction with ISM-produced software can be measured using questionnaires and structured group interviews.

Joel B. Friedman

Revenue Cost Ratio of Collecting Trust Fund Recovery Penalties

October 1992
Collection Research Section
Office of Assistant Commissioner (Collection)

On average, for every dollar spent investigating and collecting CY 1991 Trust Fund Recovery Penalty assessments, IRS can potentially collect 24.3 dollars.

Data on Trust Fund Recovery Penalties (formerly called 100 Percent Penalties) were analyzed.

Controlling for the balance due amount, we discovered the trust fund recovery penalty has a smaller revenue to cost ratio than the average Form 1040 taxpayer delinquent account (TDA) and business TDA. However, the average trust fund recovery penalty is more than two times larger than the typical TDA account. Thus, such cases yield a greater amount of revenue. The average trust fund recovery penalty assessment in calendar year (CY) 1991 was $35,883 with a projected revenue to cost ratio of $24.3 to $1.

TABLE NOTES

1. Detail may not add due to rounding.

2. The years displayed represent the calendar year in which the tax return was filed, except Federal tax deposits (Table 2), which are presented on a fiscal year basis.

3. Economic and demographic data projections were made in June 1994 by Data Resources, Inc. Economic and demographic data are not available for the Assistant Commissioner (International).

4. Federal tax deposit projections were made in January 1994. Withholding and information document projections (Table 2) were made in May 1994. Tax return projections are available in IRS Document 6149 (districts and regions) and Document 6186 (service centers). However, the 1994 updates were not yet available at the time this publication went to press.

5. Total returns consist of the following tax forms:

• **Individual**	Paper and electronic Forms 1040, 1040A, 1040EZ, 1040NR, 1040PR, 1040SS
• **Estimated Tax**	Form 1040ES
• **Fiduciary**	Form 1041 and Form 1041ES
• **Partnership**	Form 1065
• **Corporation**	Forms 1120, 1120A, 1120DF, 1120F, 1120FSC, 1120H, 1120POL, 1120REIT, 1120RIC, 1120S, 1120PC, and 1120L
• **Estate**	Forms 706 and 706NA
• **Gift**	Form 709
• **Employment**	Forms 940, 940EZ, 940PR, 941, 941E, 941PR, 941SS, 942, 942PR, 943, 943PR, and CT-1
• **Form 1042**	
• **Form 8752**	
• **Exempt Organization**	Forms 990, 900C, 990EZ, 990PF, 990T, 4720, and 5227
• **Employee Plans**	Forms 5500, 5500C, 5500EZ and 5500R
• **Excise**	Forms 11C, 720, 730 and 2290
• **Supplemental Documents**	Forms 1040X, 1120X, 2688, 4868, 7004, and 1041A (prior to 1993)

6. Withholding documents consist of the following: Forms W2, W2P (prior to 1992) and W2G.

7. Information documents consist of the following: Forms 1098, 1099A, 1099B, 1099DIV, 1099G, 1099INT, 1099MISC, 1099OID, 1099PATR, 1099R, 1099S, 1099SSA/RRB, 5498, 1096 (1993 only), Schedules K-1 and foreign information returns.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
United States								
Total Returns	189,398	198,924	204,264	203,081		See Notes below		
Total Individual Returns	103,462	110,129	114,134	114,116		" " "		
Corporation Returns	4,027	4,320	4,518	4,777		" " "		
Employment Returns	28,165	28,823	28,465	28,869		" " "		
Excise Tax Returns	956	887	821	859		" " "		
Civilian Employment	112,201	117,008	117,480	119,383	125,099	128,402	132,061	135,094
Construction Employment	4,829	5,020	4,572	4,527	4,996	5,207	5,286	5,315
Finance, Real Estate, and Insurance Employment	6,490	6,637	6,617	6,608	6,801	6,984	7,190	7,366
Government Employment	17,312	18,118	18,768	19,097	19,660	20,485	21,292	22,045
Manufacturing Employment	18,971	19,387	18,344	17,894	17,654	17,286	17,059	16,717
Mining Employment	708	684	686	603	589	584	577	571
Services Employment	24,168	26,807	28,198	29,666	31,803	34,228	36,258	38,031
Transporation, Public Utilities Employment	5,386	5,643	5,740	5,706	5,773	5,833	5,877	5,869
Trade Employment	24,338	25,737	25,418	25,587	26,664	27,558	28,420	29,067
Personal Income ($)	3,906,810	4,502,180	4,981,910	5,534,310	6,203,690	6,923,970	7,764,630	8,603,500
Real Personal Income ('87 $)	3,785,850	3,993,430	4,028,500	4,221,920	4,471,410	4,690,500	4,923,620	5,099,110
Per Capita Personal Income ($)	16,119	18,232	19,746	21,450	23,575	25,829	28,459	31,006
Real Per Capita Personal Income ('87 $)	15,620	16,172	15,967	16,364	16,992	17,497	18,046	18,377
Population	242,367	246,938	252,301	258,007	263,146	268,072	272,832	277,478
Population Age 65 and Over	29,719	30,826	31,785	32,797	33,647	34,248	34,658	35,199
North Atlantic Region								
Total Returns	25,917	27,160	25,484	25,885		See Notes below		
Total Individual Returns	13,706	14,496	14,486	14,004		" " "		
Corporation Returns	680	737	734	788		" " "		
Employment Returns	3,930	4,094	3,882	3,822		" " "		
Excise Tax Returns	86	92	70	72		" " "		
Civilian Employment	14,679	14,968	14,591	14,580	14,976	15,248	15,600	15,874
Construction Employment	648	641	473	422	463	478	484	484
Finance, Real Estate, and Insurance Employment	1,256	1,257	1,197	1,153	1,171	1,192	1,219	1,244
Government Employment	2,252	2,330	2,317	2,276	2,320	2,389	2,457	2,520
Manufacturing Employment	2,589	2,487	2,196	2,034	1,968	1,917	1,890	1,855
Mining Employment	10	10	8	8	8	8	7	7
Services Employment	3,848	4,134	4,073	4,192	4,470	4,764	5,009	5,221
Transporation, Public Utilities Employment	672	680	675	642	645	645	646	640
Trade Employment	3,200	3,286	2,993	2,924	3,012	3,083	3,155	3,199
Personal Income ($)	564,550	657,690	705,100	766,300	853,190	946,180	1,052,420	1,159,740
Real Personal Income ('87 $)	563,710	601,120	587,300	601,870	633,350	660,030	687,500	707,870
Per Capita Personal Income ($)	174,717	200,834	214,019	231,747	256,097	282,120	311,530	339,985
Real Per Capita Personal Income ('87 $)	174,371	183,469	178,150	181,931	189,925	196,562	203,029	207,086
Population	30,849	31,164	31,256	31,441	31,672	31,893	32,201	32,516
Population Age 65 and Over	4,052	4,125	4,151	4,222	4,273	4,295	4,309	4,342
Albany District								
Total Returns	1,677	1,794	1,811	1,760		See Notes below		
Total Individual Returns	950	1,029	1,053	1,029		" " "		
Corporation Returns	35	41	42	45		" " "		
Employment Returns	237	253	244	238		" " "		
Excise Tax Returns	8	8	6	7		" " "		
Civilian Employment	915	958	973	985	1,022	1,044	1,076	1,098
Construction Employment	44	46	38	33	39	39	40	40
Finance, Real Estate, and Insurance Employment	42	45	47	50	51	51	52	53
Government Employment	226	234	236	236	241	249	257	265
Manufacturing Employment	144	141	132	121	117	115	112	109
Mining Employment	1	2	2	2	2	2	1	1
Services Employment	221	240	251	269	292	314	336	350
Transporation, Public Utilities Employment	37	39	39	38	39	39	40	39
Trade Employment	199	212	204	201	211	216	222	227
Personal Income ($)	35,410	41,330	44,890	50,660	57,240	64,360	72,160	79,930
Real Personal Income ('87 $)	35,410	37,820	37,450	39,830	42,600	45,040	47,430	49,060
Per Capita Personal Income ($)	15,696	17,970	19,200	21,430	23,751	26,237	28,910	31,481
Real Per Capita Personal Income ('87 $)	15,696	16,443	16,018	16,849	17,676	18,361	19,002	19,323
Population	2,256	2,300	2,338	2,364	2,410	2,453	2,496	2,539
Population Age 65 and Over	289	296	300	304	310	314	316	319

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Augusta District								
Total Returns	948	1,027	1,024	1,004	See Notes below			
Total Individual Returns	512	559	564	548	"	"	"	
Corporation Returns	19	21	22	24	"	"	"	
Employment Returns	155	168	158	157	"	"	"	
Excise Tax Returns	8	8	6	7	"	"	"	
Civilian Employment	561	590	598	601	617	630	645	658
Construction Employment	31	33	22	22	24	25	25	25
Finance, Real Estate, and Insurance Employment	25	25	25	24	25	26	27	28
Government Employment	88	94	96	94	94	97	100	103
Manufacturing Employment	104	105	95	92	91	90	88	87
Mining Employment	0	0	0	0	0	0	0	0
Services Employment	108	124	127	132	144	155	166	175
Transporation, Public Utilities Employment	21	22	22	21	21	21	21	21
Trade Employment	124	138	127	129	135	140	144	146
Personal Income ($)	16,930	20,010	21,370	23,370	26,140	29,190	32,820	36,270
Real Personal Income ('87 $)	16,870	18,260	17,760	18,330	19,340	20,270	21,260	21,970
Per Capita Personal Income ($)	14,251	16,388	17,290	18,847	20,879	23,112	25,701	28,095
Real Per Capita Personal Income ('87 $)	14,200	14,955	14,369	14,782	15,447	16,049	16,648	17,018
Population	1,188	1,221	1,236	1,240	1,252	1,263	1,277	1,291
Population Age 65 and Over	159	164	166	170	172	173	174	175
Boston District								
Total Returns	5,174	5,442	5,309	5,142	See Notes below			
Total Individual Returns	2,793	2,945	2,881	2,779	"	"	"	
Corporation Returns	116	125	123	130	"	"	"	
Employment Returns	720	758	700	695	"	"	"	
Excise Tax Returns	16	17	12	12	"	"	"	
Civilian Employment	2,988	3,053	2,882	2,953	3,039	3,098	3,175	3,233
Construction Employment	138	127	79	75	88	90	90	89
Finance, Real Estate, and Insurance Employment	218	217	202	193	198	202	207	211
Government Employment	397	409	390	375	381	392	403	414
Manufacturing Employment	599	561	485	444	429	420	416	411
Mining Employment	2	2	1	1	1	1	1	1
Services Employment	854	924	890	922	984	1,052	1,109	1,155
Transporation, Public Utilities Employment	131	128	123	119	119	119	119	118
Trade Employment	723	741	651	643	665	681	698	708
Personal Income ($)	113,150	131,630	137,610	148,680	166,150	184,430	206,540	227,590
Real Personal Income ('87 $)	112,750	120,110	114,390	116,600	122,890	128,070	133,790	137,870
Per Capita Personal Income ($)	19,046	21,891	22,950	24,714	27,372	30,116	33,334	36,362
Real Per Capita Personal Income ('87 $)	18,978	19,975	19,078	19,382	20,245	20,913	21,593	22,027
Population	5,941	6,013	5,996	6,016	6,070	6,124	6,196	6,259
Population Age 65 and Over	812	827	826	843	854	861	866	873
Brooklyn District								
Total Returns	5,374	5,570	5,532	5,276	See Notes below			
Total Individual Returns	2,953	3,083	3,009	2,991	"	"	"	
Corporation Returns	166	178	179	194	"	"	"	
Employment Returns	761	784	754	744	"	"	"	
Excise Tax Returns	11	14	8	9	"	"	"	
Civilian Employment	2,006	2,037	1,979	1,948	1,983	2,002	2,034	2,063
Construction Employment	115	120	98	81	81	80	80	81
Finance, Real Estate, and Insurance Employment	121	129	126	129	131	134	137	139
Government Employment	250	257	254	246	248	251	256	261
Manufacturing Employment	321	304	250	228	220	211	206	200
Mining Employment	0	0	0	0	0	0	0	0
Services Employment	549	580	592	610	645	681	709	739
Transporation, Public Utilities Employment	137	145	146	136	136	136	136	134
Trade Employment	507	505	466	449	462	471	480	484
Personal Income ($)	123,660	143,660	154,130	167,890	185,460	204,350	226,460	249,200
Real Personal Income ('87 $)	123,660	131,470	128,570	132,020	138,030	143,010	148,850	152,940
Per Capita Personal Income ($)	17,935	20,875	22,448	24,269	26,700	29,356	32,421	35,554
Real Per Capita Personal Income ('87 $)	17,935	19,103	18,726	19,084	19,872	20,544	21,310	21,821
Population	6,895	6,882	6,866	6,918	6,946	6,961	6,985	7,009
Population Age 65 and Over	888	893	895	906	914	914	912	914

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Buffalo District								
Total Returns	3,275	3,448	3,489	3,367	See Notes below			
Total Individual Returns	1,905	2,040	2,080	2,024	"	"	"	
Corporation Returns	54	61	62	65	"	"	"	
Employment Returns	434	453	444	434	"	"	"	
Excise Tax Returns	15	13	11	12	"	"	"	
Civilian Employment	1,929	2,028	2,052	2,057	2,127	2,158	2,206	2,242
Construction Employment	75	82	73	66	78	79	80	80
Finance, Real Estate, and Insurance Employment	94	99	99	97	99	100	101	103
Government Employment	339	350	357	355	365	375	387	397
Manufacturing Employment	440	452	417	390	376	362	355	348
Mining Employment	3	2	2	2	2	2	2	1
Services Employment	455	496	516	546	594	641	678	707
Transporation, Public Utilities Employment	80	84	84	84	86	86	86	86
Trade Employment	438	465	454	445	462	473	484	492
Personal Income ($)	66,380	76,610	83,580	92,560	105,090	117,860	131,450	145,220
Real Personal Income ('87 $)	66,380	70,110	69,720	72,780	78,210	82,480	86,400	89,120
Per Capita Personal Income ($)	14,666	16,705	18,028	19,812	22,284	24,844	27,437	29,942
Real Per Capita Personal Income ('87 $)	14,666	15,288	15,039	15,578	16,584	17,386	18,034	18,375
Population	4,526	4,586	4,636	4,672	4,716	4,744	4.791	4,850
Population Age 65 and Over	602	623	637	649	663	671	678	690
Burlington District								
Total Returns	482	526	531	525	See Notes below			
Total Individual Returns	237	262	266	263	"	"	"	
Corporation Returns	12	14	14	16	"	"	"	
Employment Returns	92	99	96	95	"	"	"	
Excise Tax Returns	3	3	3	3	"	"	"	
Civilian Employment	285	296	291	308	323	333	343	351
Construction Employment	16	18	12	12	12	13	14	14
Finance, Real Estate, and Insurance Employment	12	13	12	12	12	12	13	13
Government Employment	39	42	44	43	44	46	48	50
Manufacturing Employment	50	49	44	43	43	42	42	41
Mining Employment	1	1	1	1	1	1	1	1
Services Employment	61	68	68	71	77	83	88	92
Transporation, Public Utilities Employment	10	10	11	11	11	11	11	11
Trade Employment	57	62	58	59	61	64	66	67
Personal Income ($)	7,920	9,450	10,110	11,210	12,550	14,080	15,980	17,800
Real Personal Income ('87 $)	7,900	8,620	8,400	8,790	9,280	9,780	10,350	10,780
Per Capita Personal Income ($)	14,613	16,905	17,799	19,428	21,307	23,467	26,111	28,571
Real Per Capita Personal Income ('87 $)	14,576	15,420	14,789	15,234	15,756	16,300	16,912	17,303
Population	542	559	568	577	589	600	612	623
Population Age 65 and Over	64	67	67	69	71	72	73	74
Hartford District								
Total Returns	3,039	3,193	3,130	2,963	See Notes below			
Total Individual Returns	1,589	1,671	1,649	1,564	"	"	"	
Corporation Returns	67	75	72	77	"	"	"	
Employment Returns	426	453	426	414	"	"	"	
Excise Tax Returns	10	11	9	8	"	"	"	
Civilian Employment	1,695	1,697	1,679	1,649	1,681	1,710	1,749	1,780
Construction Employment	78	76	51	45	49	52	52	52
Finance, Real Estate, and Insurance Employment	150	152	148	139	137	140	144	147
Government Employment	201	208	209	207	212	219	225	232
Manufacturing Employment	385	360	322	290	276	267	265	260
Mining Employment	2	1	1	1	1	1	1	1
Services Employment	386	427	416	422	447	477	502	523
Transporation, Public Utilities Employment	72	73	70	66	65	65	65	64
Trade Employment	370	378	340	323	325	331	339	344
Personal Income ($)	68,940	80,340	84,900	92,030	100,680	110,630	123,320	135,340
Real Personal Income ('87 $)	68,700	73,310	70,570	72,170	74,470	76,830	79,880	81,980
Per Capita Personal Income ($)	21,212	24,472	25,821	28,075	30,620	33,484	37,033	40,244
Real Per Capita Personal Income ('87 $)	21,138	22,330	21,463	22,016	22,649	23,254	23,988	24,377
Population	3,250	3,283	3,288	3,278	3,288	3,304	3,330	3,363
Population Age 65 and Over	434	447	451	462	467	469	471	475

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Manhattan District								
Total Returns	4,194	4,292	4,199	4,060	See Notes below			
Total Individual Returns	1,816	1,887	1,890	1,828	" " "			
Corporation Returns	169	175	174	186	" " "			
Employment Returns	830	833	789	780	" " "			
Excise Tax Returns	7	10	6	7	" " "			
Civilian Employment	3,228	3,215	3,080	2,995	3,060	3,123	3,191	3,246
Construction Employment	95	88	69	56	61	65	68	68
Finance, Real Estate, and Insurance Employment	536	518	482	455	463	472	483	492
Government Employment	587	607	598	584	595	616	631	645
Manufacturing Employment	314	292	260	240	234	231	227	222
Mining Employment	1	1	1	1	1	1	1	0
Services Employment	988	1,024	963	958	1,009	1,064	1,108	1,152
Transporation, Public Utilities Employment	151	146	148	136	136	136	136	134
Trade Employment	549	542	484	460	468	480	490	494
Personal Income ($)	97,040	113,890	125,350	133,100	147,450	162,910	177,870	195,640
Real Personal Income ('87 $)	97,040	104,220	104,570	104,660	109,740	114,010	116,910	120,070
Per Capita Personal Income ($)	23,088	27,027	29,732	31,325	34,719	38,215	41,336	45,026
Real Per Capita Personal Income ('87 $)	23,088	24,732	24,803	24,632	25,839	26,744	27,169	27,634
Population	4,203	4,214	4,216	4,249	4,247	4,263	4,303	4,345
Population Age 65 and Over	538	534	529	530	528	524	521	520
Portsmouth District								
Total Returns	943	1,013	981	962	See Notes below			
Total Individual Returns	504	550	538	530	" " "			
Corporation Returns	20	22	22	24	" " "			
Employment Returns	149	159	144	140	" " "			
Excise Tax Returns	6	6	5	5	" " "			
Civilian Employment	573	589	589	600	634	652	672	687
Construction Employment	37	30	17	17	19	20	20	20
Finance, Real Estate, and Insurance Employment	31	32	30	29	30	31	32	33
Government Employment	65	71	72	74	78	82	85	88
Manufacturing Employment	116	114	98	97	97	97	96	95
Mining Employment	1	1	0	0	0	0	0	0
Services Employment	114	126	126	133	142	153	162	170
Transporation, Public Utilities Employment	17	18	17	17	17	17	18	18
Trade Employment	130	137	121	125	130	133	137	140
Personal Income ($)	19,480	22,620	23,940	26,200	29,710	33,070	37,520	41,590
Real Personal Income ('87 $)	19,410	20,640	19,900	20,540	21,980	22,970	24,300	25,200
Per Capita Personal Income ($)	18,412	20,471	21,587	23,248	25,880	28,289	31,556	34,457
Real Per Capita Personal Income ('87 $)	18,346	18,679	17,944	18,225	19,146	19,649	20,437	20,878
Population	1,058	1,105	1,109	1,127	1,148	1,169	1,189	1,207
Population Age 65 and Over	121	126	128	134	137	139	140	142
Providence District								
Total Returns	813	858	847	827	See Notes below			
Total Individual Returns	446	472	467	448	" " "			
Corporation Returns	22	24	25	26	" " "			
Employment Returns	127	134	127	124	" " "			
Excise Tax Returns	3	3	2	3	" " "			
Civilian Employment	499	504	469	482	491	499	509	517
Construction Employment	20	20	14	13	13	14	14	14
Finance, Real Estate, and Insurance Employment	26	27	26	25	25	25	26	26
Government Employment	58	59	61	61	61	63	65	66
Manufacturing Employment	116	108	92	88	85	84	82	81
Mining Employment	0	0	0	0	0	0	0	0
Services Employment	113	125	125	129	135	144	151	157
Transporation, Public Utilities Employment	16	16	14	15	15	15	15	15
Trade Employment	103	107	90	91	92	94	96	97
Personal Income ($)	15,640	18,150	19,220	20,600	22,720	25,300	28,300	31,160
Real Personal Income ('87 $)	15,590	16,560	15,970	16,150	16,810	17,570	18,330	18,880
Per Capita Personal Income ($)	15,798	18,132	19,163	20,600	22,584	25,000	27,691	30,252
Real Per Capita Personal Income ('87 $)	15,747	16,543	15,922	16,150	16,710	17,362	17,935	18,330
Population	990	1,001	1,003	1,000	1,006	1,012	1,022	1,030
Population Age 65 and Over	145	148	152	155	157	158	158	160

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Mid-Atlantic Region								
Total Returns	25,628	26,912	26,957	26,797	See	Notes below		
Total Individual Returns	14,263	15,101	15,161	14,966	"	" "		
Corporation Returns	542	589	626	663	"	" "		
Employment Returns	3,597	3,725	3,662	3,687	"	" "		
Excise Tax Returns	100	97	92	90	"	" "		
Civilian Employment	14,925	15,501	15,285	15,400	15,989	16,372	16,793	17,153
Construction Employment	752	791	638	581	629	648	657	660
Finance, Real Estate, and Insurance Employment	850	886	878	872	894	916	941	961
Government Employment	2,468	2,552	2,592	2,614	2,655	2,726	2,816	2,900
Manufacturing Employment	2,436	2,410	2,215	2,094	2,052	2,003	1,979	1,943
Mining Employment	50	46	42	37	35	34	32	31
Services Employment	3,607	3,986	4,109	4,253	4,543	4,877	5,150	5,379
Transporation, Public Utilities Employment	759	784	781	773	778	782	783	780
Trade Employment	3,238	3,398	3,258	3,220	3,342	3,436	3,534	3,603
Personal Income ($)	545,560	634,970	695,280	768,520	860,650	957,770	1,070,910	1,179,780
Real Personal Income ('87 $)	544,280	579,950	578,610	603,190	637,850	666,790	696,970	717,660
Per Capita Personal Income ($)	102,854	118,020	128,149	138,927	152,759	167,410	184,585	200,624
Real Per Capita Personal Income ('87 $)	102,596	107,778	106,631	109,032	113,191	116,519	120,086	121,997
Population	31,243	31,696	32,136	32,635	33,142	33,610	34,077	34,582
Population Age 65 and Over	4,005	4,138	4,265	4,398	4,494	4,553	4,591	4,654
Baltimore District								
Total Returns	4,363	4,615	4,666	4,750	See	Notes below		
Total Individual Returns	2,451	2,598	2,629	2,595	"	" "		
Corporation Returns	92	101	109	115	"	" "		
Employment Returns	633	647	640	659	"	" "		
Excise Tax Returns	14	13	13	12	"	" "		
Civilian Employment	2,611	2,729	2,663	2,698	2,882	2,982	3,086	3,171
Construction Employment	167	177	141	121	125	128	133	136
Finance, Real Estate, and Insurance Employment	161	165	165	160	164	168	172	176
Government Employment	663	688	698	705	698	706	724	742
Manufacturing Employment	225	226	206	193	188	185	184	182
Mining Employment	2	2	1	1	1	1	1	1
Services Employment	766	851	875	894	960	1,038	1,098	1,148
Transporation, Public Utilities Employment	118	125	124	121	123	124	124	123
Trade Employment	581	602	567	553	576	596	618	634
Personal Income ($)	96,000	113,080	124,400	136,000	152,080	170,470	192,850	214,170
Real Personal Income ('87 $)	95,660	103,190	103,400	106,650	112,480	118,380	124,920	129,740
Per Capita Personal Income ($)	18,412	21,113	22,776	24,522	26,884	29,478	32,653	35,488
Real Per Capita Personal Income ('87 $)	18,347	19,266	18,931	19,230	19,883	20,470	21,151	21,498
Population	5,214	5,356	5,462	5,546	5,657	5,783	5,906	6,035
Population Age 65 and Over	569	592	606	626	643	657	668	683
Newark District								
Total Returns	7,014	7,327	7,115	6,961	See	Notes below		
Total Individual Returns	3,804	4,007	3,824	3,746	"	" "		
Corporation Returns	202	214	221	235	"	" "		
Employment Returns	1,002	1,046	1,007	1,008	"	" "		
Excise Tax Returns	22	24	20	20	"	" "		
Civilian Employment	3,806	3,826	3,772	3,705	3,879	3,955	4,052	4,134
Construction Employment	163	164	122	99	109	111	111	112
Finance, Real Estate, and Insurance Employment	227	242	229	227	235	239	245	250
Government Employment	542	559	567	569	587	608	631	651
Manufacturing Employment	672	640	558	508	499	490	485	477
Mining Employment	2	3	2	2	2	2	2	2
Services Employment	873	955	964	981	1,044	1,112	1,170	1,224
Transporation, Public Utilities Employment	239	241	232	228	226	225	225	225
Trade Employment	858	887	825	796	820	837	858	875
Personal Income ($)	158,100	184,480	197,840	219,630	247,580	274,620	307,650	338,090
Real Personal Income ('87 $)	157,550	168,340	164,450	172,230	183,110	190,700	199,280	204,800
Per Capita Personal Income ($)	20,597	23,878	25,429	27,861	31,072	34,114	37,813	41,000
Real Per Capita Personal Income ('87 $)	20,525	21,789	21,138	21,848	22,981	23,689	24,494	24,836
Population	7,676	7,726	7,780	7,883	7,968	8,050	8,136	8,246
Population Age 65 and Over	995	1,020	1,044	1,072	1,090	1,100	1,107	1,120

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
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Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Philadelphia District								
Total Returns	5,983	6,277	6,303	6,173	See Notes below			
Total Individual Returns	3,306	3,503	3,557	3,477	"	"		
Corporation Returns	103	114	122	129	"	"		
Employment Returns	781	807	791	777	"	"		
Excise Tax Returns	25	25	23	22	"	"		
Civilian Employment	3,570	3,731	3,568	3,596	3,672	3,751	3,835	3,903
Construction Employment	149	161	134	124	135	140	143	143
Finance, Real Estate, and Insurance Employment	208	213	215	216	219	225	231	235
Government Employment	448	454	459	455	462	472	487	500
Manufacturing Employment	736	729	667	639	627	612	603	592
Mining Employment	6	5	4	4	4	4	4	4
Services Employment	847	927	957	996	1,061	1,140	1,200	1,246
Transporation, Public Utilities Employment	160	164	165	166	168	169	169	167
Trade Employment	735	774	749	744	775	797	814	824
Personal Income ($)	120,790	139,640	153,230	169,070	188,770	209,660	231,660	253,270
Real Personal Income ('87 $)	120,790	127,790	127,820	132,940	140,490	146,730	152,270	155,440
Per Capita Personal Income ($)	16,292	18,609	20,231	22,147	24,398	26,787	29,232	31,615
Real Per Capita Personal Income ('87 $)	16,292	17,030	16,876	17,414	18,158	18,747	19,214	19,403
Population	7,414	7,504	7,574	7,634	7,737	7,827	7,925	8,011
Population Age 65 and Over	1,065	1,095	1,130	1,157	1,178	1,188	1,194	1,203
Pittsburgh District								
Total Returns	3,234	3,322	3,375	3,312	See Notes below			
Total Individual Returns	1,835	1,906	1,955	1,922	"	"		
Corporation Returns	42	46	49	51	"	"		
Employment Returns	428	438	438	436	"	"		
Excise Tax Returns	20	18	18	18	"	"		
Civilian Employment	1,747	1,844	1,827	1,864	1,893	1,919	1,951	1,981
Construction Employment	69	72	71	70	76	80	80	80
Finance, Real Estate, and Insurance Employment	83	83	85	85	85	87	89	89
Government Employment	237	241	240	241	250	257	266	274
Manufacturing Employment	304	313	301	286	277	267	262	256
Mining Employment	24	22	20	17	16	15	15	15
Services Employment	423	466	495	518	545	575	599	620
Transporation, Public Utilities Employment	87	92	98	99	100	100	99	98
Trade Employment	382	405	405	416	431	440	448	451
Personal Income ($)	61,010	69,010	77,080	84,900	93,560	102,870	112,710	123,270
Real Personal Income ('87 $)	61,010	63,150	64,300	66,750	69,630	71,990	74,080	75,650
Per Capita Personal Income ($)	14,006	15,978	17,781	19,406	21,187	23,211	25,300	27,442
Real Per Capita Personal Income ('87 $)	14,006	14,621	14,833	15,257	15,768	16,243	16,629	16,841
Population	4,356	4,319	4,335	4,375	4,416	4,432	4,455	4,492
Population Age 65 and Over	675	692	719	744	760	767	771	782
Richmond District								
Total Returns	4,498	4,794	4,904	4,997	See Notes below			
Total Individual Returns	2,577	2,773	2,870	2,899	"	"		
Corporation Returns	88	99	106	112	"	"		
Employment Returns	671	701	700	718	"	"		
Excise Tax Returns	16	15	15	16	"	"		
Civilian Employment	2,870	3,023	3,113	3,177	3,286	3,380	3,476	3,563
Construction Employment	183	196	153	148	165	169	169	168
Finance, Real Estate, and Insurance Employment	144	152	152	151	157	161	166	171
Government Employment	530	563	580	595	606	629	654	676
Manufacturing Employment	429	430	412	403	398	388	385	377
Mining Employment	16	15	14	13	12	12	11	10
Services Employment	626	705	733	776	838	911	973	1,026
Transporation, Public Utilities Employment	143	147	148	145	147	149	151	151
Trade Employment	610	655	637	634	662	686	713	734
Personal Income ($)	98,850	115,880	127,980	142,790	160,730	180,300	203,810	226,280
Real Personal Income ('87 $)	98,500	105,730	106,380	111,970	118,880	125,210	132,020	137,070
Per Capita Personal Income ($)	16,630	18,898	20,305	21,981	24,177	26,554	29,465	32,101
Real Per Capita Personal Income ('87 $)	16,571	17,242	16,878	17,237	17,882	18,440	19,086	19,445
Population	5,944	6,132	6,303	6,496	6,648	6,790	6,917	7,049
Population Age 65 and Over	627	661	683	712	733	749	759	772

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Wilmington District								
Total Returns	526	578	593	604	See Notes below			
Total Individual Returns	291	315	327	327	"	"		
Corporation Returns	15	17	18	19	"	"		
Employment Returns	81	85	86	90	"	"		
Excise Tax Returns	3	3	2	2	"	"		
Civilian Employment	321	349	342	361	377	385	394	402
Construction Employment	20	21	18	19	20	20	21	21
Finance, Real Estate, and Insurance Employment	27	30	33	34	35	36	37	38
Government Employment	47	47	48	50	51	53	56	58
Manufacturing Employment	71	73	70	66	64	61	60	60
Mining Employment	0	0	0	0	0	0	0	0
Services Employment	72	82	84	88	95	103	109	114
Transporation, Public Utilities Employment	13	15	15	15	15	15	15	15
Trade Employment	71	76	74	76	78	81	83	85
Personal Income ($)	10,810	12,880	14,750	16,130	17,930	19,850	22,230	24,700
Real Personal Income ('87 $)	10,770	11,750	12,260	12,650	13,260	13,780	14,400	14,960
Per Capita Personal Income ($)	16,917	19,545	21,628	23,010	25,042	27,266	30,122	32,977
Real Per Capita Personal Income ('87 $)	16,854	17,830	17,977	18,046	18,520	18,929	19,512	19,973
Population	639	659	682	701	716	728	738	749
Population Age 65 and Over	74	78	83	87	90	92	92	94
Southeast Region								
Total Returns	33,796	35,805	37,065	37,294	See Notes below			
Total Individual Returns	32,028	20,119	21,071	21,401	"	"		
Corporation Returns	778	854	921	977	"	"		
Employment Returns	5,319	5,421	5,345	5,474	"	"		
Excise Tax Returns	175	160	146	160	"	"		
Civilian Employment	20,782	21,646	21,874	22,416	23,641	24,403	25,185	25,847
Construction Employment	1,060	1,069	970	981	1,088	1,150	1,174	1,181
Finance, Real Estate, and Insurance Employment	1,037	1,066	1,051	1,055	1,099	1,127	1,165	1,201
Government Employment	3,181	3,394	3,569	3,666	3,820	4,009	4,188	4,360
Manufacturing Employment	3,811	3,928	3,778	3,816	3,805	3,756	3,699	3,615
Mining Employment	107	107	106	87	86	86	84	83
Services Employment	3,871	4,407	4,736	5,165	5,618	6,107	6,528	6,882
Transporation, Public Utilities Employment	1,005	1,075	1,100	1,112	1,131	1,146	1,161	1,164
Trade Employment	4,516	4,847	4,821	4,999	5,262	5,472	5,668	5,823
Personal Income ($)	625,530	728,340	818,200	927,400	1,053,350	1,187,090	1,345,290	1,502,280
Real Personal Income ('87 $)	624,050	665,210	680,830	727,880	780,580	826,340	875,510	913,890
Per Capita Personal Income ($)	131,647	149,391	163,799	180,831	199,978	219,854	243,670	266,025
Real Per Capita Personal Income ('87 $)	131,315	136,418	136,261	141,901	148,123	152,947	158,387	161,648
Population	46,123	47,210	48,545	49,922	51,260	52,526	53,655	54,781
Population Age 65 and Over	6,086	6,381	6,652	6,908	7,150	7,339	7,470	7,628
Atlanta District								
Total Returns	4,312	4,601	4,758	4,924	See Notes below			
Total Individual Returns	2,543	2,737	2,866	2,944	"	"		
Corporation Returns	93	103	113	119	"	"		
Employment Returns	707	729	713	743	"	"		
Excise Tax Returns	22	20	19	21	"	"		
Civilian Employment	2,883	3,018	3,008	3,114	3,279	3,371	3,461	3,541
Construction Employment	152	146	125	129	144	150	152	154
Finance, Real Estate, and Insurance Employment	155	164	163	164	169	175	180	186
Government Employment	477	512	537	541	564	590	614	640
Manufacturing Employment	571	568	541	547	552	544	534	521
Mining Employment	8	9	8	7	7	8	7	7
Services Employment	540	611	640	710	780	845	898	944
Transporation, Public Utilities Employment	175	189	194	203	208	211	213	214
Trade Employment	703	742	730	771	818	846	875	902
Personal Income ($)	89,950	104,030	116,810	133,480	153,950	173,360	195,610	217,460
Real Personal Income ('87 $)	89,630	94,930	97,090	104,670	113,860	120,390	126,710	131,730
Per Capita Personal Income ($)	14,459	16,199	17,571	19,275	21,653	23,813	26,331	28,681
Real Per Capita Personal Income ('87 $)	14,408	14,782	14,604	15,115	16,014	16,537	17,056	17,374
Population	6,221	6,422	6,648	6,925	7,110	7,280	7,429	7,582
Population Age 65 and Over	622	652	670	696	718	734	745	758

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Birmingham District								
Total Returns	2,548	2,675	2,774	2,787	See Notes below			
Total Individual Returns	1,535	1,623	1,704	1,737	" " "			
Corporation Returns	42	46	49	51	" " "			
Employment Returns	412	416	410	420	" " "			
Excise Tax Returns	18	16	14	16	" " "			
Civilian Employment	1,746	1,773	1,758	1,816	1,882	1,924	1,972	1,999
Construction Employment	75	78	79	77	85	89	90	90
Finance, Real Estate, and Insurance Employment	70	72	73	75	78	79	82	83
Government Employment	301	318	333	342	353	366	378	388
Manufacturing Employment	369	386	379	380	376	373	369	362
Mining Employment	11	12	12	11	10	10	10	10
Services Employment	276	304	326	356	379	408	430	448
Transporation, Public Utilities Employment	73	82	83	83	83	84	84	84
Trade Employment	332	350	357	372	387	398	407	415
Personal Income ($)	49,070	56,380	64,000	72,210	81,110	90,450	101,420	111,540
Real Personal Income ('87 $)	48,910	51,450	53,200	56,630	59,990	62,810	65,700	67,570
Per Capita Personal Income ($)	12,222	13,983	15,621	17,230	19,085	21,035	23,331	25,460
Real Per Capita Personal Income ('87 $)	12,182	12,760	12,985	13,512	14,115	14,607	15,114	15,423
Population	4,015	4,032	4,097	4,191	4,250	4,300	4,347	4,381
Population Age 65 and Over	497	512	531	545	556	563	566	569
Columbia District								
Total Returns	2,244	2,400	2,518	2,536	See Notes below			
Total Individual Returns	1,345	1,461	1,546	1,554	" " "			
Corporation Returns	44	49	52	55	" " "			
Employment Returns	366	371	369	374	" " "			
Excise Tax Returns	11	10	9	10	" " "			
Civilian Employment	1,541	1,615	1,635	1,668	1,749	1,784	1,823	1,854
Construction Employment	87	93	88	81	83	88	90	92
Finance, Real Estate, and Insurance Employment	63	67	66	65	67	68	70	72
Government Employment	258	273	286	296	298	310	322	333
Manufacturing Employment	374	390	369	368	366	359	350	339
Mining Employment	2	2	2	2	2	2	2	2
Services Employment	241	275	296	323	346	376	399	419
Transporation, Public Utilities Employment	59	64	66	64	66	67	67	67
Trade Employment	308	337	341	359	374	386	397	405
Personal Income ($)	41,670	47,970	55,310	61,710	68,820	76,730	86,050	95,290
Real Personal Income ('87 $)	41,520	43,780	45,970	48,390	50,900	53,280	55,740	57,720
Per Capita Personal Income ($)	12,314	13,856	15,515	16,911	18,411	20,203	22,327	24,340
Real Per Capita Personal Income ('87 $)	12,270	12,646	12,895	13,261	13,617	14,028	14,463	14,743
Population	3,384	3,462	3,565	3,649	3,738	3,798	3,854	3,915
Population Age 65 and Over	363	384	407	427	441	449	454	462
Fort Lauderdale District								
Total Returns	5,241	5,706	5,959	5,982	See Notes below			
Total Individual Returns	2,339	2,585	2,759	2,790	" " "			
Corporation Returns	193	217	238	256	" " "			
Employment Returns	800	852	858	895	" " "			
Excise Tax Returns	13	13	11	13	" " "			
Civilian Employment	2,366	2,483	2,525	2,591	2,774	2,915	3,061	3,183
Construction Employment	151	154	120	127	146	155	160	162
Finance, Real Estate, and Insurance Employment	169	176	164	160	169	174	180	186
Government Employment	269	299	323	332	354	380	405	429
Manufacturing Employment	203	202	185	181	178	177	177	175
Mining Employment	2	2	1	1	1	1	1	1
Services Employment	570	649	689	732	804	879	948	1,008
Transporation, Public Utilities Employment	122	125	129	131	133	137	140	141
Trade Employment	577	629	615	633	675	713	746	771
Personal Income ($)	90,650	110,260	122,160	136,470	156,330	178,500	206,500	234,870
Real Personal Income ('87 $)	90,650	100,900	101,910	107,310	116,350	124,920	135,730	144,150
Per Capita Personal Income ($)	17,695	20,339	21,522	23,356	25,674	28,221	31,522	34,688
Real Per Capita Personal Income ('87 $)	17,695	18,613	17,955	18,366	19,108	19,750	20,719	21,289
Population	5,123	5,421	5,676	5,843	6,089	6,325	6,551	6,771
Population Age 65 and Over	1,022	1,084	1,150	1,194	1,247	1,291	1,325	1,363

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Greensboro District								
Total Returns	4,649	4,998	5,151	5,163	See Notes below			
Total Individual Returns	2,705	2,927	3,034	3,083	"	"	"	
Corporation Returns	88	99	106	111	"	"	"	
Employment Returns	741	765	756	759	"	"	"	
Excise Tax Returns	23	24	21	23	"	"	"	
Civilian Employment	3,127	3,272	3,304	3,382	3,561	3,657	3,761	3,856
Construction Employment	160	163	147	149	155	169	167	165
Finance, Real Estate, and Insurance Employment	126	132	134	140	146	150	156	161
Government Employment	442	477	502	520	551	583	610	636
Manufacturing Employment	856	871	826	845	843	828	811	788
Mining Employment	5	5	5	3	3	4	3	3
Services Employment	489	563	602	678	733	798	851	895
Transporation, Public Utilities Employment	141	151	153	155	158	160	162	163
Trade Employment	643	712	703	729	764	794	823	851
Personal Income ($)	87,010	102,240	114,630	130,820	146,100	163,480	183,540	203,750
Real Personal Income ('87 $)	86,710	93,290	95,270	102,590	108,060	113,520	118,890	123,430
Per Capita Personal Income ($)	13,568	15,547	16,960	18,807	20,451	22,398	24,633	26,763
Real Per Capita Personal Income ('87 $)	13,521	14,186	14,095	14,748	15,126	15,553	15,956	16,213
Population	6,413	6,576	6,759	6,956	7,144	7,299	7,451	7,613
Population Age 65 and Over	755	798	827	867	897	918	934	954
Jackson District								
Total Returns	1,533	1,617	1,663	1,666	See Notes below			
Total Individual Returns	917	969	1,011	1,036	"	"	"	
Corporation Returns	27	29	30	31	"	"	"	
Employment Returns	268	265	258	261	"	"	"	
Excise Tax Returns	14	12	11	12	"	"	"	
Civilian Employment	1,034	1,076	1,081	1,120	1,176	1,204	1,223	1,235
Construction Employment	34	36	35	38	41	43	44	44
Finance, Real Estate, and Insurance Employment	38	39	39	39	40	41	42	43
Government Employment	191	200	204	215	222	230	237	243
Manufacturing Employment	229	244	247	252	253	252	250	245
Mining Employment	6	6	6	5	5	5	5	5
Services Employment	139	154	166	186	198	214	227	234
Transporation, Public Utilities Employment	42	45	45	45	45	45	45	45
Trade Employment	185	196	197	203	212	218	224	227
Personal Income ($)	27,000	30,870	34,470	39,550	44,480	49,530	55,430	60,780
Real Personal Income ('87 $)	26,920	28,170	28,650	31,020	32,900	34,400	35,910	36,820
Per Capita Personal Income ($)	10,433	11,993	13,283	14,953	16,647	18,406	20,446	22,231
Real Per Capita Personal Income ('87 $)	10,402	10,944	11,040	11,728	12,313	12,783	13,246	13,467
Population	2,588	2,574	2,595	2,645	2,672	2,691	2,711	2,734
Population Age 65 and Over	313	320	324	330	334	336	336	338
Jacksonville District								
Total Returns	5,540	5,850	6,085	6,114	See Notes below			
Total Individual Returns	2,953	3,166	3,349	3,381	"	"	"	
Corporation Returns	136	151	167	179	"	"	"	
Employment Returns	785	809	796	814	"	"	"	
Excise Tax Returns	21	19	17	19	"	"	"	
Civilian Employment	3,190	3,360	3,475	3,575	3,801	3,969	4,149	4,325
Construction Employment	191	186	157	152	176	188	197	201
Finance, Real Estate, and Insurance Employment	190	194	194	195	205	210	216	225
Government Employment	463	501	536	553	580	609	640	674
Manufacturing Employment	328	336	308	299	291	289	287	284
Mining Employment	6	8	7	5	5	5	5	5
Services Employment	734	856	932	1,012	1,113	1,218	1,315	1,403
Transporation, Public Utilities Employment	132	141	146	147	149	151	154	155
Trade Employment	739	803	787	807	853	891	924	956
Personal Income ($)	97,780	116,240	129,830	146,770	167,900	190,620	218,860	248,990
Real Personal Income ('87 $)	97,780	106,370	108,310	115,410	124,960	133,400	143,860	152,810
Per Capita Personal Income ($)	14,148	15,987	17,038	18,637	20,558	22,572	25,142	27,690
Real Per Capita Personal Income ('87 $)	14,148	14,629	14,214	14,655	15,301	15,796	16,526	16,994
Population	6,911	7,271	7,620	7,875	8,167	8,445	8,705	8,992
Population Age 65 and Over	1,121	1,197	1,282	1,346	1,413	1,468	1,514	1,568

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Little Rock District								
Total Returns	1,593	1,663	1,705	1,707	See	Notes below		
Total Individual Returns	881	931	3,584	986	"	" "		
Corporation Returns	30	32	34	35	"	" "		
Employment Returns	256	256	252	260	"	" "		
Excise Tax Returns	15	14	13	14	"	" "		
Civilian Employment	1,001	1,054	1,036	1,079	1,128	1,163	1,196	1,222
Construction Employment	34	33	36	39	43	45	47	48
Finance, Real Estate, and Insurance Employment	38	38	38	40	41	42	43	44
Government Employment	146	154	163	169	175	186	195	202
Manufacturing Employment	220	231	234	242	243	241	238	233
Mining Employment	4	4	4	4	4	4	4	4
Services Employment	154	176	199	216	235	252	268	284
Transporation, Public Utilities Employment	51	55	56	56	57	58	59	59
Trade Employment	190	202	207	218	228	239	248	255
Personal Income ($)	27,300	30,910	34,790	39,860	45,290	51,210	57,790	63,700
Real Personal Income ('87 $)	27,220	28,210	28,910	31,260	33,500	35,560	37,440	38,590
Per Capita Personal Income ($)	11,657	13,170	14,655	16,410	18,174	19,911	21,965	23,742
Real Per Capita Personal Income ('87 $)	11,623	12,020	12,178	12,869	13,443	13,826	14,230	14,383
Population	2,342	2,347	2,374	2,429	2,492	2,572	2,631	2,683
Population Age 65 and Over	340	347	355	363	374	385	390	396
Nashville District								
Total Returns	3,301	3,485	3,584	3,595	See	Notes below		
Total Individual Returns	1,966	2,095	2,165	2,206	"	" "		
Corporation Returns	51	55	59	61	"	" "		
Employment Returns	516	525	514	522	"	" "		
Excise Tax Returns	20	18	17	18	"	" "		
Civilian Employment	2,180	2,247	2,256	2,332	2,485	2,552	2,617	2,662
Construction Employment	95	97	87	89	100	106	107	107
Finance, Real Estate, and Insurance Employment	101	103	102	101	105	108	112	115
Government Employment	321	344	353	356	366	381	396	408
Manufacturing Employment	497	525	503	518	518	512	505	495
Mining Employment	7	6	6	5	4	4	4	4
Services Employment	409	467	505	552	599	649	691	723
Transporation, Public Utilities Employment	103	116	117	123	126	127	128	127
Trade Employment	477	508	512	529	558	579	596	606
Personal Income ($)	63,720	72,990	82,010	94,370	106,570	119,670	134,580	148,690
Real Personal Income ('87 $)	63,500	66,600	68,170	74,010	78,820	83,100	87,180	90,070
Per Capita Personal Income ($)	13,308	15,025	16,528	18,486	20,443	22,537	25,006	27,348
Real Per Capita Personal Income ('87 $)	13,262	13,709	13,738	14,498	15,120	15,650	16,198	16,566
Population	4,788	4,858	4,962	5,105	5,213	5,310	5,382	5,437
Population Age 65 and Over	593	615	631	652	669	680	684	690
New Orleans District								
Total Returns	2,815	2,811	2,869	2,820	See	Notes below		
Total Individual Returns	1,603	1,624	1,675	1,685	"	" "		
Corporation Returns	74	73	74	78	"	" "		
Employment Returns	466	431	418	427	"	" "		
Excise Tax Returns	18	15	13	15	"	" "		
Civilian Employment	1,715	1,749	1,796	1,739	1,806	1,865	1,923	1,970
Construction Employment	81	83	97	100	113	117	120	119
Finance, Real Estate, and Insurance Employment	85	80	79	77	79	81	83	84
Government Employment	313	316	332	341	357	376	392	406
Manufacturing Employment	164	176	186	184	184	182	179	174
Mining Employment	55	54	56	44	43	43	43	43
Services Employment	319	354	381	399	431	469	501	524
Transporation, Public Utilities Employment	105	108	110	104	105	106	108	108
Trade Employment	361	367	372	380	394	408	427	435
Personal Income ($)	51,380	56,450	64,190	72,160	82,800	93,540	105,510	117,210
Real Personal Income ('87 $)	51,210	51,510	53,350	56,590	61,240	64,960	68,350	71,000
Per Capita Personal Income ($)	11,844	13,292	15,107	16,766	18,883	20,759	22,967	25,082
Real Per Capita Personal Income ('87 $)	11,805	12,129	12,556	13,148	13,966	14,416	14,878	15,194
Population	4,338	4,247	4,249	4,304	4,385	4,506	4,594	4,673
Population Age 65 and Over	460	472	475	488	501	515	522	530

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes Section for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1984	1986	1988	1990	1992	1994	1996	1998
Central Region								
Total Returns	22,153	23,042	23,734	23,615	See Notes below			
Total Individual Returns	12,807	13,542	13,945	13,909	"	"	"	
Corporation Returns	413	448	479	507	"	"	"	
Employment Returns	3,093	3,170	3,141	3,185	"	"	"	
Excise Tax Returns	116	107	101	105	"	"	"	
Civilian Employment	13,648	14,339	14,291	14,629	15,268	15,586	15,925	16,161
Construction Employment	484	536	513	530	582	603	610	609
Finance, Real Estate, and Insurance Employment	623	645	657	665	684	702	719	732
Government Employment	2,014	2,075	2,138	2,175	2,241	2,328	2,405	2,480
Manufacturing Employment	3,036	3,111	2,946	2,948	2,912	2,839	2,795	2,736
Mining Employment	114	104	99	83	77	75	73	72
Services Employment	2,731	3,012	3,171	3,359	3,589	3,840	4,050	4,227
Transporation, Public Utilities Employment	585	615	616	615	628	634	637	633
Trade Employment	2,961	3,165	3,178	3,214	3,348	3,448	3,539	3,600
Personal Income ($)	559,510	637,340	697,730	775,610	865,350	955,730	1,060,610	1,163,680
Real Personal Income ('87 $)	444,490	461,950	461,300	485,360	511,380	530,710	550,810	564,270
Per Capita Personal Income ($)	103,566	117,329	127,754	140,110	153,880	168,202	184,919	200,633
Real Per Capita Personal Income ('87 $)	82,554	85,423	85,053	88,394	91,820	94,451	97,211	98,581
Population	30,955	31,093	31,457	31,913	32,373	32,732	33,052	33,428
Population Age 65 and Over	3,773	3,902	4,018	4,141	4,226	4,270	4,288	4,332
Cincinnati District								
Total Returns	3,389	3,571	3,715	3,738	See Notes below			
Total Individual Returns	1,969	2,127	2,210	2,227	"	"	"	
Corporation Returns	54	60	65	68	"	"	"	
Employment Returns	452	465	460	459	"	"	"	
Excise Tax Returns	12	11	12	13	"	"	"	
Civilian Employment	2,173	2,288	2,310	2,351	2,457	2,520	2,582	2,632
Construction Employment	83	91	82	88	97	100	101	101
Finance, Real Estate, and Insurance Employment	126	131	131	131	135	139	143	147
Government Employment	339	351	365	371	379	393	406	420
Manufacturing Employment	431	434	419	407	402	395	390	382
Mining Employment	9	8	7	6	6	6	6	5
Services Employment	473	518	551	580	621	668	706	738
Transporation, Public Utilities Employment	92	100	101	100	101	103	104	104
Trade Employment	494	530	531	542	564	583	600	611
Personal Income ($)	67,970	77,810	86,250	96,420	107,850	119,750	132,950	146,760
Real Personal Income ('87 $)	67,970	71,210	71,950	75,820	80,260	83,810	87,390	90,070
Per Capita Personal Income ($)	14,499	16,381	17,828	19,558	21,548	23,652	25,992	28,229
Real Per Capita Personal Income ('87 $)	14,499	14,992	14,872	15,379	16,036	16,553	17,085	17,324
Population	4,688	4,750	4,838	4,930	5,005	5,063	5,115	5,199
Population Age 65 and Over	536	554	573	592	602	606	606	612
Cleveland District								
Total Returns	4,583	4,757	4,911	4,849	See Notes below			
Total Individual Returns	2,608	2,776	2,861	2,843	"	"	"	
Corporation Returns	83	91	96	101	"	"	"	
Employment Returns	625	636	626	629	"	"	"	
Excise Tax Returns	22	20	20	21	"	"	"	
Civilian Employment	2,689	2,805	2,778	2,794	2,896	2,939	2,994	3,035
Construction Employment	93	103	97	97	104	107	107	108
Finance, Real Estate, and Insurance Employment	118	121	124	127	131	134	137	139
Government Employment	347	354	362	364	376	391	404	417
Manufacturing Employment	667	688	647	635	626	611	601	587
Mining Employment	12	10	9	7	7	7	7	7
Services Employment	578	628	654	683	723	768	808	840
Transporation, Public Utilities Employment	116	116	112	108	108	109	110	109
Trade Employment	602	631	625	622	643	659	676	686
Personal Income ($)	89,760	101,100	109,170	120,060	132,900	145,790	160,830	176,240
Real Personal Income ('87 $)	89,760	92,520	91,070	94,410	98,910	102,030	105,710	108,160
Per Capita Personal Income ($)	14,797	16,653	17,891	19,484	21,298	23,171	25,336	27,460
Real Per Capita Personal Income ('87 $)	14,797	15,240	14,925	15,321	15,851	16,216	16,652	16,853
Population	6,066	6,071	6,102	6,162	6,240	6,292	6,348	6,418
Population Age 65 and Over	805	834	860	887	906	917	924	937

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Detroit District								
Total Returns	6,631	6,886	7,029	6,949	See	Notes below		
Total Individual Returns	3,880	4,060	4,149	4,100	"	"	"	
Corporation Returns	136	150	160	168	"	"	"	
Employment Returns	926	963	959	978	"	"	"	
Excise Tax Returns	31	27	25	25	"	"	"	
Civilian Employment	4,066	4,247	4,212	4,344	4,516	4,594	4,685	4,733
Construction Employment	123	140	129	132	143	150	152	150
Finance, Real Estate, and Insurance Employment	180	187	190	188	192	196	199	202
Government Employment	612	623	636	639	653	675	694	713
Manufacturing Employment	972	971	897	900	884	851	836	820
Mining Employment	10	10	9	8	8	8	8	8
Services Employment	826	912	945	1,005	1,074	1,142	1,198	1,244
Transporation, Public Utilities Employment	152	155	154	155	157	158	157	155
Trade Employment	860	922	931	939	974	999	1,018	1,032
Personal Income ($)	144,070	163,670	176,590	195,220	217,000	238,140	263,440	286,810
Real Personal Income ('87 $)	143,590	149,350	146,780	153,090	160,500	165,370	170,650	173,750
Per Capita Personal Income ($)	15,679	17,673	18,822	20,582	22,689	24,721	27,181	29,389
Real Per Capita Personal Income ('87 $)	15,626	16,127	15,645	16,140	16,782	17,167	17,607	17,804
Population	9,189	9,261	9,382	9,485	9,564	9,633	9,692	9,759
Population Age 65 and Over	1,058	1,098	1,131	1,172	1,190	1,199	1,201	1,208
Indianapolis District								
Total Returns	3,989	4,155	4,289	4,289	See	Notes below		
Total Individual Returns	2,305	2,440	2,517	2,519	"	"	"	
Corporation Returns	77	81	86	94	"	"	"	
Employment Returns	544	557	555	571	"	"	"	
Excise Tax Returns	25	26	23	24	"	"	"	
Civilian Employment	2,513	2,664	2,675	2,797	2,966	3,034	3,100	3,155
Construction Employment	99	113	114	113	126	128	129	129
Finance, Real Estate, and Insurance Employment	115	121	125	131	136	140	144	146
Government Employment	347	367	380	391	406	425	441	457
Manufacturing Employment	616	646	619	632	624	611	602	587
Mining Employment	9	8	8	6	6	6	6	6
Services Employment	452	503	534	568	610	656	693	725
Transporation, Public Utilities Employment	119	130	131	130	137	139	139	139
Trade Employment	548	592	596	602	635	658	676	690
Personal Income ($)	191,510	220,090	240,780	267,960	300,000	331,790	368,510	405,280
Real Personal Income ('87 $)	77,200	80,730	80,900	86,800	92,130	95,990	99,690	102,280
Per Capita Personal Income ($)	34,979	39,821	42,897	46,846	51,300	55,801	61,133	66,211
Real Per Capita Personal Income ('87 $)	14,100	14,606	14,413	15,175	15,754	16,144	16,538	16,710
Population	5,475	5,527	5,613	5,720	5,848	5,946	6,028	6,121
Population Age 65 and Over	663	686	709	729	750	761	767	778
Louisville District								
Total Returns	2,413	2,512	2,597	2,606	See	Notes below		
Total Individual Returns	1,381	1,461	1,512	1,527	"	"	"	
Corporation Returns	44	48	51	54	"	"	"	
Employment Returns	372	376	371	376	"	"	"	
Excise Tax Returns	17	16	14	15	"	"	"	
Civilian Employment	1,537	1,634	1,615	1,653	1,709	1,753	1,798	1,827
Construction Employment	62	66	64	70	76	82	82	82
Finance, Real Estate, and Insurance Employment	60	60	62	63	65	67	70	71
Government Employment	240	253	267	278	286	298	308	316
Manufacturing Employment	262	284	281	291	291	289	286	281
Mining Employment	39	35	32	28	26	25	24	24
Services Employment	277	313	336	358	383	413	441	464
Transporation, Public Utilities Employment	70	77	80	83	85	86	87	87
Trade Employment	318	345	351	360	374	385	398	408
Personal Income ($)	45,150	51,620	58,800	66,680	74,820	83,420	93,520	102,910
Real Personal Income ('87 $)	44,990	47,100	48,870	52,290	55,340	57,930	60,580	62,340
Per Capita Personal Income ($)	12,259	14,031	15,802	17,575	19,383	21,324	23,622	25,773
Real Per Capita Personal Income ('87 $)	12,216	12,802	13,134	13,782	14,337	14,808	15,302	15,612
Population	3,683	3,679	3,721	3,794	3,860	3,912	3,959	3,993
Population Age 65 and Over	452	466	473	483	493	498	500	503

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Parkersburg District								
Total Returns	1,149	1,161	1,193	1,182	See Notes below			
Total Individual Returns	663	678	696	692	"	"	"	
Corporation Returns	19	20	21	22	"	"	"	
Employment Returns	173	172	169	172	"	"	"	
Excise Tax Returns	9	8	7	7	"	"	"	
Civilian Employment	669	701	701	690	726	746	765	780
Construction Employment	24	25	27	30	36	37	38	39
Finance, Real Estate, and Insurance Employment	24	24	25	25	26	26	27	27
Government Employment	128	126	128	133	141	147	152	157
Manufacturing Employment	86	88	83	83	83	82	80	79
Mining Employment	36	33	34	27	25	24	22	22
Services Employment	125	138	151	164	178	193	205	215
Transporation, Public Utilities Employment	36	37	38	39	40	41	41	40
Trade Employment	139	145	144	149	158	165	170	173
Personal Income ($)	21,050	23,050	26,140	29,270	32,780	36,840	41,360	45,680
Real Personal Income ('87 $)	20,980	21,040	21,730	22,950	24,240	25,580	26,790	27,670
Per Capita Personal Income ($)	11,354	12,770	14,514	16,065	17,662	19,533	21,654	23,571
Real Per Capita Personal Income ('87 $)	11,316	11,657	12,066	12,596	13,060	13,563	14,026	14,278
Population	1,854	1,805	1,801	1,822	1,856	1,886	1,910	1,938
Population Age 65 and Over	259	264	272	278	285	289	290	294
Midwest Region								
Total Returns	25,203	26,131	26,931	26,755	See Notes below			
Total Individual Returns	13,631	14,384	14,819	14,817	"	"	"	
Corporation Returns	497	527	558	589	"	"	"	
Employment Returns	3,714	3,795	3,811	3,897	"	"	"	
Excise Tax Returns	190	190	179	188	"	"	"	
Civilian Employment	15,321	15,941	16,077	16,391	17,218	17,636	18,051	18,406
Construction Employment	537	565	563	590	660	686	685	689
Finance, Real Estate, and Insurance Employment	879	904	929	951	985	1,011	1,035	1,055
Government Employment	2,245	2,321	2,396	2,438	2,526	2,635	2,732	2,823
Manufacturing Employment	2,636	2,785	2,703	2,693	2,694	2,639	2,603	2,547
Mining Employment	53	51	50	46	43	42	42	41
Services Employment	3,200	3,552	3,761	3,972	4,269	4,560	4,795	5,013
Transporation, Public Utilities Employment	777	816	828	827	839	847	851	849
Trade Employment	3,406	3,588	3,594	3,635	3,802	3,915	4,018	4,099
Personal Income ($)	493,720	561,660	621,380	692,000	779,170	865,970	965,230	1,064,980
Real Personal Income ('87 $)	492,710	513,090	517,200	543,240	577,640	603,130	628,710	648,310
Per Capita Personal Income ($)	143,843	161,232	178,213	195,763	216,846	237,605	262,364	285,934
Real Per Capita Personal Income ('87 $)	143,472	147,225	148,237	153,616	160,586	165,274	170,487	173,688
Population	31,962	32,197	32,594	33,115	33,704	34,268	34,744	35,245
Population Age 65 and Over	4,158	4,247	4,350	4,438	4,537	4,605	4,637	4,692
Aberdeen District								
Total Returns	559	579	602	612	See Notes below			
Total Individual Returns	285	298	312	317	"	"	"	
Corporation Returns	9	10	10	11	"	"	"	
Employment Returns	98	99	100	103	"	"	"	
Excise Tax Returns	7	10	7	8	"	"	"	
Civilian Employment	340	346	349	354	365	374	385	393
Construction Employment	10	10	12	13	14	15	15	15
Finance, Real Estate, and Insurance Employment	14	16	17	18	19	19	20	20
Government Employment	59	62	63	66	69	72	74	77
Manufacturing Employment	29	32	35	40	42	41	40	39
Mining Employment	3	3	3	3	3	3	3	3
Services Employment	62	67	75	80	86	92	97	103
Transporation, Public Utilities Employment	13	14	14	15	15	15	15	15
Trade Employment	67	72	79	81	85	88	90	92
Personal Income ($)	8,770	9,840	11,430	12,800	14,530	16,280	18,300	20,160
Real Personal Income ('87 $)	8,740	8,980	9,500	10,040	10,740	11,300	11,860	12,210
Per Capita Personal Income ($)	12,601	14,118	16,259	17,902	19,904	21,882	24,206	26,284
Real Per Capita Personal Income ('87 $)	12,557	12,884	13,514	14,042	14,712	15,188	15,688	15,919
Population	696	697	703	715	730	744	756	767
Population Age 65 and Over	97	100	104	105	108	110	111	112

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Chicago District								
Total Returns	6,638	6,904	7,102	6,999	See Notes below			
Total Individual Returns	3,709	3,903	4,001	3,965	"	"	"	
Corporation Returns	151	164	175	186	"	"	"	
Employment Returns	876	911	930	952	"	"	"	
Excise Tax Returns	20	20	18	21	"	"	"	
Civilian Employment	4,139	4,319	4,269	4,337	4,559	4,644	4,731	4,811
Construction Employment	156	170	161	157	174	181	179	181
Finance, Real Estate, and Insurance Employment	298	311	316	317	328	335	342	348
Government Employment	501	518	535	536	550	568	585	602
Manufacturing Employment	762	789	744	732	736	721	710	693
Mining Employment	5	3	3	2	2	2	2	2
Services Employment	950	1,054	1,103	1,142	1,218	1,297	1,362	1,422
Transporation, Public Utilities Employment	232	244	244	242	245	247	247	247
Trade Employment	967	1,005	976	971	1,011	1,032	1,054	1,075
Personal Income ($)	149,020	172,310	189,080	210,540	235,010	259,530	286,440	315,540
Real Personal Income ('87 $)	149,020	157,680	157,730	165,550	174,900	181,630	188,280	193,660
Per Capita Personal Income ($)	17,872	20,562	22,247	24,351	26,760	29,253	31,976	34,782
Real Per Capita Personal Income ('87 $)	17,872	18,816	18,559	19,148	19,916	20,472	21,018	21,347
Population	8,338	8,380	8,499	8,646	8,782	8,872	8,958	9,072
Population Age 65 and Over	943	963	996	1,018	1,039	1,049	1,054	1,067
Des Moines District								
Total Returns	2,257	2,325	2,395	2,362	See Notes below			
Total Individual Returns	1,151	1,225	1,266	1,261	"	"	"	
Corporation Returns	43	43	45	47	"	"	"	
Employment Returns	346	348	346	352	"	"	"	
Excise Tax Returns	19	18	17	17	"	"	"	
Civilian Employment	1,370	1,448	1,447	1,524	1,596	1,634	1,672	1,707
Construction Employment	36	41	45	48	54	56	56	56
Finance, Real Estate, and Insurance Employment	65	68	72	74	77	80	81	83
Government Employment	210	217	221	224	234	245	254	264
Manufacturing Employment	213	235	233	232	233	227	224	221
Mining Employment	2	2	2	2	2	2	2	2
Services Employment	248	277	298	306	330	351	369	385
Transporation, Public Utilities Employment	53	56	55	54	54	55	55	55
Trade Employment	282	305	313	319	333	343	353	361
Personal Income ($)	39,200	44,070	48,770	54,410	61,500	68,260	76,560	84,300
Real Personal Income ('87 $)	39,070	40,220	40,540	42,670	45,490	47,400	49,590	51,060
Per Capita Personal Income ($)	14,157	15,898	17,468	19,322	21,541	23,514	25,997	28,147
Real Per Capita Personal Income ('87 $)	14,110	14,509	14,520	15,153	15,933	16,328	16,839	17,048
Population	2,769	2,772	2,792	2,816	2,855	2,903	2,945	2,995
Population Age 65 and Over	412	418	430	436	444	451	454	460
Fargo District								
Total Returns	555	556	562	563	See Notes below			
Total Individual Returns	273	279	281	282	"	"	"	
Corporation Returns	9	10	10	10	"	"	"	
Employment Returns	98	99	96	96	"	"	"	
Excise Tax Returns	8	10	9	10	"	"	"	
Civilian Employment	315	317	304	303	319	325	332	339
Construction Employment	11	10	10	12	13	13	13	13
Finance, Real Estate, and Insurance Employment	13	12	13	13	14	14	15	15
Government Employment	65	66	66	68	69	72	74	77
Manufacturing Employment	16	16	18	19	19	19	19	18
Mining Employment	4	4	4	4	4	4	4	4
Services Employment	61	66	71	76	81	86	90	94
Transporation, Public Utilities Employment	16	17	17	18	18	18	18	18
Trade Employment	68	69	72	74	78	79	81	82
Personal Income ($)	8,530	8,900	10,060	11,350	12,820	14,300	15,980	17,620
Real Personal Income ('87 $)	8,500	8,120	8,360	8,900	9,480	9,930	10,350	10,670
Per Capita Personal Income ($)	12,924	13,798	15,893	17,846	20,000	22,034	24,397	26,576
Real Per Capita Personal Income ('87 $)	12,879	12,589	13,207	13,994	14,789	15,300	15,802	16,094
Population	660	645	633	636	641	649	655	663
Population Age 65 and Over	87	90	92	94	96	97	97	98

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Helena District								
Total Returns	681	689	716	746	See Notes below			
Total Individual Returns	331	341	355	369	"	"	"	
Corporation Returns	15	15	16	17	"	"	"	
Employment Returns	126	122	121	127	"	"	"	
Excise Tax Returns	9	8	7	7	"	"	"	
Civilian Employment	374	381	375	385	404	416	427	439
Construction Employment	9	10	11	14	13	15	15	15
Finance, Real Estate, and Insurance Employment	13	13	14	15	15	16	16	17
Government Employment	69	70	72	74	75	78	80	83
Manufacturing Employment	21	22	22	23	22	22	22	22
Mining Employment	6	6	6	6	5	5	5	5
Services Employment	64	72	77	85	92	98	104	113
Transporation, Public Utilities Employment	20	20	20	20	20	21	21	21
Trade Employment	73	77	82	88	90	94	97	99
Personal Income ($)	10,190	11,350	12,710	14,240	15,940	18,070	20,870	23,790
Real Personal Income ('87 $)	10,160	10,360	10,560	11,170	11,790	12,550	13,510	14,410
Per Capita Personal Income ($)	12,658	14,188	15,711	16,952	18,513	20,534	23,266	26,057
Real Per Capita Personal Income ('87 $)	12,621	12,950	13,053	13,298	13,693	14,261	15,061	15,783
Population	805	800	809	840	861	880	897	913
Population Age 65 and Over	100	105	109	113	116	119	120	122
Milwaukee District								
Total Returns	3,699	3,879	4,027	4,021	See Notes below			
Total Individual Returns	2,033	2,168	2,253	2,271	"	"	"	
Corporation Returns	67	71	75	79	"	"	"	
Employment Returns	558	569	572	585	"	"	"	
Excise Tax Returns	26	24	23	24	"	"	"	
Civilian Employment	2,322	2,454	2,484	2,567	2,699	2,772	2,837	2,894
Construction Employment	72	81	87	101	113	118	119	119
Finance, Real Estate, and Insurance Employment	113	117	124	130	136	140	144	146
Government Employment	325	335	346	362	376	394	410	425
Manufacturing Employment	529	559	546	551	552	542	534	522
Mining Employment	2	2	2	2	2	2	2	2
Services Employment	460	513	546	586	633	681	719	753
Transporation, Public Utilities Employment	95	101	108	112	113	115	115	115
Trade Employment	494	528	543	551	577	597	613	626
Personal Income ($)	70,850	80,530	90,020	101,060	114,420	127,350	142,130	156,560
Real Personal Income ('87 $)	70,600	73,480	74,830	79,250	84,620	88,430	92,070	94,840
Per Capita Personal Income ($)	14,807	16,556	18,175	20,036	22,166	24,211	26,626	28,848
Real Per Capita Personal Income ('87 $)	14,754	15,107	15,108	15,712	16,393	16,812	17,248	17,476
Population	4,785	4,864	4,953	5,044	5,162	5,260	5,338	5,427
Population Age 65 and Over	634	652	661	676	695	707	713	723
Omaha District								
Total Returns	1,296	1,336	1,377	1,379	See Notes below			
Total Individual Returns	668	706	732	735	"	"	"	
Corporation Returns	28	29	30	32	"	"	"	
Employment Returns	214	216	214	218	"	"	"	
Excise Tax Returns	21	19	20	19	"	"	"	
Civilian Employment	772	787	834	846	891	918	942	959
Construction Employment	25	25	27	29	33	35	35	35
Finance, Real Estate, and Insurance Employment	48	48	49	49	50	52	53	54
Government Employment	135	140	146	147	152	159	166	172
Manufacturing Employment	89	95	100	102	103	101	100	98
Mining Employment	2	1	2	2	2	1	1	1
Services Employment	153	169	181	186	200	214	224	233
Transporation, Public Utilities Employment	43	46	47	47	48	48	49	48
Trade Employment	173	184	188	188	198	205	211	215
Personal Income ($)	22,310	25,330	28,850	32,070	36,100	40,490	45,640	50,230
Real Personal Income ('87 $)	22,240	23,120	23,980	25,150	26,700	28,120	29,570	30,430
Per Capita Personal Income ($)	14,228	16,072	18,133	19,919	22,026	24,130	26,753	29,102
Real Per Capita Personal Income ('87 $)	14,184	14,670	15,072	15,621	16,290	16,758	17,333	17,630
Population	1,568	1,576	1,591	1,610	1,639	1,678	1,706	1,726
Population Age 65 and Over	217	219	225	229	234	239	241	243

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Saint Louis District								
Total Returns	3,915	4,045	4,137	4,094	See	Notes below		
Total Individual Returns	2,123	2,222	2,279	2,267	"	"	"	
Corporation Returns	76	79	82	87	"	"	"	
Employment Returns	585	597	594	603	"	"	"	
Excise Tax Returns	24	22	20	22	"	"	"	
Civilian Employment	2,426	2,471	2,511	2,508	2,649	2,712	2,775	2,828
Construction Employment	99	97	89	95	109	112	112	113
Finance, Real Estate, and Insurance Employment	135	137	137	138	141	145	147	150
Government Employment	344	359	371	378	391	408	423	436
Manufacturing Employment	424	441	416	405	395	386	380	372
Mining Employment	5	5	5	4	4	4	4	4
Services Employment	507	559	586	615	661	705	736	767
Transporation, Public Utilities Employment	143	152	152	153	155	156	157	156
Trade Employment	540	564	554	557	579	597	612	623
Personal Income ($)	75,360	84,790	94,270	102,970	115,900	129,370	144,560	159,470
Real Personal Income ('87 $)	75,110	77,370	78,350	80,750	85,720	89,840	93,640	96,600
Per Capita Personal Income ($)	14,893	16,625	18,266	19,658	21,806	23,882	26,327	28,676
Real Per Capita Personal Income ('87 $)	14,844	15,171	15,181	15,416	16,128	16,585	17,053	17,371
Population	5,060	5,100	5,161	5,238	5,315	5,417	5,491	5,561
Population Age 65 and Over	697	711	727	742	756	768	772	779
Saint Paul District								
Total Returns	3,353	3,526	3,661	3,681	See	Notes below		
Total Individual Returns	1,821	1,954	2,013	2,036	"	"	"	
Corporation Returns	69	75	80	86	"	"	"	
Employment Returns	490	511	521	540	"	"	"	
Excise Tax Returns	44	44	45	46	"	"	"	
Civilian Employment	2,139	2,241	2,307	2,360	2,469	2,550	2,635	2,699
Construction Employment	80	79	76	78	88	91	92	92
Finance, Real Estate, and Insurance Employment	119	121	127	135	141	147	151	155
Government Employment	314	329	342	352	369	389	407	422
Manufacturing Employment	376	400	395	398	403	396	393	386
Mining Employment	6	8	8	7	7	7	7	7
Services Employment	478	531	561	622	678	728	769	807
Transporation, Public Utilities Employment	100	105	110	108	110	112	114	113
Trade Employment	489	514	518	536	566	588	608	622
Personal Income ($)	67,810	77,590	85,570	96,110	110,100	122,920	138,360	153,190
Real Personal Income ('87 $)	67,590	70,800	71,130	75,370	81,430	85,360	89,630	92,800
Per Capita Personal Income ($)	15,974	17,857	19,312	21,244	23,769	25,851	28,457	30,991
Real Per Capita Personal Income ('87 $)	15,922	16,295	16,053	16,660	17,580	17,952	18,435	18,774
Population	4,245	4,345	4,431	4,524	4,632	4,755	4,862	4,943
Population Age 65 and Over	534	548	556	569	585	599	608	616
Springfield District								
Total Returns	2,250	2,292	2,352	2,299	See	Notes below		
Total Individual Returns	1,237	1,290	1,328	1,313	"	"	"	
Corporation Returns	30	31	33	34	"	"	"	
Employment Returns	322	322	317	319	"	"	"	
Excise Tax Returns	14	13	13	13	"	"	"	
Civilian Employment	1,123	1,176	1,197	1,209	1,270	1,292	1,315	1,337
Construction Employment	40	43	44	43	48	50	49	50
Finance, Real Estate, and Insurance Employment	61	61	61	62	63	64	65	66
Government Employment	222	225	234	231	241	250	258	266
Manufacturing Employment	177	197	196	190	188	184	181	176
Mining Employment	18	16	15	13	12	11	11	11
Services Employment	217	243	263	273	291	308	323	337
Transporation, Public Utilities Employment	63	61	61	60	60	60	60	60
Trade Employment	253	269	271	270	285	292	299	304
Personal Income ($)	41,680	46,950	50,620	56,450	62,850	69,400	76,390	84,120
Real Personal Income ('87 $)	41,680	42,960	42,220	44,390	46,770	48,570	50,210	51,630
Per Capita Personal Income ($)	13,729	15,557	16,750	18,533	20,360	22,315	24,359	26,469
Real Per Capita Personal Income ('87 $)	13,729	14,235	13,971	14,573	15,151	15,617	16,011	16,246
Population	3,036	3,018	3,022	3,046	3,087	3,110	3,136	3,178
Population Age 65 and Over	437	441	450	456	464	466	467	472

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Southwest Region								
Total Returns	24,178	24,976	29,957	26,347	See Notes below			
Total Individual Returns	13,109	13,780	14,470	14,860	"	"	"	
Corporation Returns	511	525	554	582	"	"	"	
Employment Returns	3,747	3,677	3,647	3,801	"	"	"	
Excise Tax Returns	139	112	106	112	"	"	"	
Civilian Employment	14,839	15,363	15,746	16,267	17,322	17,923	18,560	19,086
Construction Employment	662	605	628	681	764	786	799	806
Finance, Real Estate, and Insurance Employment	824	810	807	823	858	889	922	948
Government Employment	2,409	2,533	2,682	2,828	2,922	3,078	3,222	3,354
Manufacturing Employment	1,767	1,855	1,843	1,831	1,844	1,806	1,792	1,763
Mining Employment	312	296	310	280	280	281	279	278
Services Employment	2,879	3,245	3,531	3,786	4,107	4,454	4,747	5,000
Transporation, Public Utilities Employment	747	792	833	843	860	875	887	890
Trade Employment	3,175	3,303	3,398	3,521	3,707	3,862	4,014	4,127
Personal Income ($)	455,890	511,090	579,570	659,710	748,930	846,380	957,230	1,068,590
Real Personal Income ('87 $)	455,130	467,020	482,650	518,050	555,690	590,100	624,720	651,680
Per Capita Personal Income ($)	137,921	153,023	169,811	185,800	204,795	224,282	247,331	269,402
Real Per Capita Personal Income ('87 $)	137,582	139,740	141,318	145,818	151,768	156,115	160,934	163,844
Population	32,493	32,910	33,845	35,158	36,195	37,310	38,289	39,132
Population Age 65 and Over	3,423	3,596	3,745	3,903	4,044	4,164	4,249	4,338
Albuquerque District								
Total Returns	1,040	1,077	1,131	1,162	See Notes below			
Total Individual Returns	594	622	658	680	"	"	"	
Corporation Returns	19	19	21	22	"	"	"	
Employment Returns	164	164	162	169	"	"	"	
Excise Tax Returns	7	5	5	7	"	"	"	
Civilian Employment	622	651	665	684	722	747	775	800
Construction Employment	32	30	28	34	41	41	40	42
Finance, Real Estate, and Insurance Employment	27	26	26	27	28	29	30	31
Government Employment	138	145	152	159	165	175	183	191
Manufacturing Employment	38	43	42	41	42	42	41	41
Mining Employment	15	15	17	15	15	16	16	16
Services Employment	123	140	153	165	178	190	206	218
Transporation, Public Utilities Employment	29	29	29	29	29	29	30	30
Trade Employment	128	134	138	146	155	159	168	173
Personal Income ($)	17,940	20,120	23,090	26,580	31,480	35,490	39,910	45,140
Real Personal Income ('87 $)	17,880	18,360	19,190	20,840	23,280	24,640	25,850	27,350
Per Capita Personal Income ($)	12,122	13,360	14,878	16,407	18,572	20,119	22,013	24,347
Real Per Capita Personal Income ('87 $)	12,081	12,191	12,365	12,864	13,735	13,968	14,258	14,752
Population	1,480	1,506	1,552	1,620	1,695	1,764	1,813	1,854
Population Age 65 and Over	148	159	169	178	188	196	201	206
Austin District								
Total Returns	3,741	3,845	3,991	4,094	See Notes below			
Total Individual Returns	2,131	2,231	2,340	2,446	"	"	"	
Corporation Returns	63	62	66	69	"	"	"	
Employment Returns	574	560	551	574	"	"	"	
Excise Tax Returns	19	15	14	15	"	"	"	
Civilian Employment	2,196	2,277	2,366	2,547	2,728	2,853	2,966	3,054
Construction Employment	106	88	87	98	113	119	124	125
Finance, Real Estate, and Insurance Employment	116	114	111	117	124	129	134	138
Government Employment	467	492	520	553	571	605	635	662
Manufacturing Employment	219	237	243	260	265	262	260	256
Mining Employment	24	24	27	23	23	23	23	23
Services Employment	404	449	494	540	591	649	694	729
Transporation, Public Utilities Employment	85	88	92	98	102	105	107	107
Trade Employment	471	489	502	536	564	591	614	631
Personal Income ($)	64,800	72,310	82,890	97,750	111,470	128,180	145,720	163,370
Real Personal Income ('87 $)	64,800	66,170	69,150	76,860	82,960	89,700	95,780	100,270
Per Capita Personal Income ($)	11,653	12,830	14,252	15,993	17,635	19,540	21,575	23,639
Real Per Capita Personal Income ('87 $)	11,653	11,741	11,890	12,575	13,125	13,674	14,181	14,509
Population	5,561	5,636	5,816	6,112	6,321	6,560	6,754	6,911
Population Age 65 and Over	569	599	620	653	680	705	722	738

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Cheyenne District								
Total Returns	386	386	398	409	See	Notes below		
Total Individual Returns	196	196	205	210	"	" "		
Corporation Returns	9	9	9	10	"	" "		
Employment Returns	70	68	68	72	"	" "		
Excise Tax Returns	4	3	3	3	"	" "		
Civilian Employment	220	224	228	226	239	245	253	260
Construction Employment	11	10	12	11	13	13	14	14
Finance, Real Estate, and Insurance Employment	8	7	7	8	8	8	8	8
Government Employment	50	54	56	57	60	62	65	68
Manufacturing Employment	8	9	9	9	9	9	9	9
Mining Employment	18	17	19	18	18	18	18	18
Services Employment	33	36	40	42	44	48	51	49
Transporation, Public Utilities Employment	13	14	15	14	14	15	15	15
Trade Employment	42	44	46	47	48	51	54	56
Personal Income ($)	6,400	6,940	8,150	9,070	9,970	11,220	12,700	13,710
Real Personal Income ('87 $)	6,370	6,330	6,780	7,110	7,380	7,790	8,230	8,300
Per Capita Personal Income ($)	13,445	15,186	17,756	19,257	20,642	22,759	25,149	26,621
Real Per Capita Personal Income ('87 $)	13,382	13,851	14,771	15,096	15,280	15,801	16,297	16,117
Population	476	457	459	471	483	493	505	515
Population Age 65 and Over	43	44	49	51	53	54	55	56
Dallas District								
Total Returns	5,363	5,488	5,679	5,638	See	Notes below		
Total Individual Returns	1,875	3,002	3,144	3,172	"	" "		
Corporation Returns	111	111	116	121	"	" "		
Employment Returns	859	823	810	832	"	" "		
Excise Tax Returns	35	27	25	26	"	" "		
Civilian Employment	3,381	3,450	3,522	3,637	3,867	3,986	4,110	4,211
Construction Employment	133	110	108	115	135	140	147	146
Finance, Real Estate, and Insurance Employment	211	205	202	197	205	214	222	227
Government Employment	422	446	472	503	518	544	570	594
Manufacturing Employment	503	513	490	482	485	471	464	457
Mining Employment	91	80	83	74	74	74	74	73
Services Employment	626	700	759	814	885	957	1,014	1,062
Transporation, Public Utilities Employment	179	190	205	210	214	217	218	218
Trade Employment	747	758	772	783	821	854	882	905
Personal Income ($)	104,990	115,430	129,450	146,770	165,980	187,870	211,290	235,600
Real Personal Income ('87 $)	104,990	105,630	107,990	115,400	123,530	131,480	138,880	144,600
Per Capita Personal Income ($)	15,397	16,731	18,354	20,275	22,466	24,769	27,225	29,770
Real Per Capita Personal Income ('87 $)	15,397	15,311	15,311	15,941	16,720	17,334	17,895	18,271
Population	6,819	6,899	7,053	7,239	7,388	7,585	7,761	7,914
Population Age 65 and Over	723	753	766	786	805	823	834	846
Denver District								
Total Returns	2,706	2,773	2,893	3,062	See	Notes below		
Total Individual Returns	1,429	1,488	1,558	1,636	"	" "		
Corporation Returns	71	75	81	86	"	" "		
Employment Returns	434	430	434	466	"	" "		
Excise Tax Returns	13	14	11	12	"	" "		
Civilian Employment	1,565	1,597	1,667	1,707	1,843	1,893	1,962	2,017
Construction Employment	67	60	66	81	79	83	86	85
Finance, Real Estate, and Insurance Employment	99	97	97	103	108	111	116	120
Government Employment	262	271	283	296	305	318	332	345
Manufacturing Employment	185	193	186	183	181	178	177	174
Mining Employment	21	20	19	16	15	16	15	15
Services Employment	342	384	421	460	500	537	577	610
Transporation, Public Utilities Employment	88	94	98	102	104	106	108	108
Trade Employment	348	364	376	397	424	443	464	479
Personal Income ($)	52,200	58,410	66,710	76,970	86,940	97,420	111,200	124,000
Real Personal Income ('87 $)	52,020	53,290	55,450	60,350	64,300	67,650	72,030	75,120
Per Capita Personal Income ($)	16,017	17,808	19,713	21,542	23,428	25,563	28,447	31,140
Real Per Capita Personal Income ('87 $)	15,962	16,247	16,386	16,891	17,327	17,751	18,427	18,865
Population	3,259	3,280	3,384	3,573	3,711	3,811	3,909	3,982
Population Age 65 and Over	302	320	341	358	373	382	389	395

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
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Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Houston District								
Total Returns	2,951	3,121	3,293	3,336	See Notes below			
Total Individual Returns	1,623	1,758	1,881	1,935	"	"	"	
Corporation Returns	71	73	78	81	"	"	"	
Employment Returns	440	430	435	460	"	"	"	
Excise Tax Returns	13	10	10	11	"	"	"	
Civilian Employment	1,982	2,123	2,271	2,306	2,447	2,537	2,624	2,690
Construction Employment	103	119	137	130	142	145	150	150
Finance, Real Estate, and Insurance Employment	119	118	117	117	120	125	129	133
Government Employment	252	266	293	312	324	342	359	374
Manufacturing Employment	202	220	238	233	234	231	229	225
Mining Employment	66	68	73	69	69	69	69	69
Services Employment	423	486	537	556	599	650	690	724
Transporation, Public Utilities Employment	119	127	135	132	134	137	139	139
Trade Employment	425	443	462	468	490	510	527	540
Personal Income ($)	61,630	72,700	85,020	94,740	105,930	119,320	133,760	149,140
Real Personal Income ('87 $)	61,630	66,530	70,930	74,500	78,840	83,510	87,920	91,530
Per Capita Personal Income ($)	14,959	17,422	19,407	20,763	22,644	24,704	26,941	29,399
Real Per Capita Personal Income ('87 $)	14,959	15,943	16,190	16,327	16,853	17,290	17,708	18,043
Population	4,120	4,173	4,381	4,563	4,678	4,830	4,965	5,073
Population Age 65 and Over	324	346	368	389	405	422	435	449
Oklahoma City District								
Total Returns	2,335	2,353	2,422	2,389	See Notes below			
Total Individual Returns	1,242	1,259	1,309	1,318	"	"	"	
Corporation Returns	51	52	54	57	"	"	"	
Employment Returns	361	348	345	353	"	"	"	
Excise Tax Returns	17	13	13	13	"	"	"	
Civilian Employment	1,448	1,438	1,416	1,437	1,495	1,526	1,580	1,625
Construction Employment	35	36	39	39	43	45	45	47
Finance, Real Estate, and Insurance Employment	60	59	61	60	61	62	64	66
Government Employment	245	257	262	269	270	283	295	306
Manufacturing Employment	157	164	169	164	167	161	162	159
Mining Employment	46	42	42	35	36	36	35	35
Services Employment	233	264	280	294	313	337	359	377
Transporation, Public Utilities Employment	63	66	70	69	68	69	70	70
Trade Employment	270	276	285	289	297	306	318	325
Personal Income ($)	40,920	45,210	49,880	55,330	61,940	69,220	78,470	87,410
Real Personal Income ('87 $)	40,790	41,250	41,460	43,390	45,810	48,070	50,830	52,950
Per Capita Personal Income ($)	12,768	14,352	15,715	17,098	18,896	20,700	22,978	25,039
Real Per Capita Personal Income ('87 $)	12,727	13,095	13,062	13,409	13,975	14,375	14,884	15,168
Population	3,205	3,150	3,174	3,236	3,278	3,344	3,415	3,491
Population Age 65 and Over	409	418	431	440	448	455	461	469
Phoenix District								
Total Returns	2,608	2,787	2,892	2,956	See Notes below			
Total Individual Returns	1,393	1,514	1,595	1,645	"	"	"	
Corporation Returns	58	61	63	67	"	"	"	
Employment Returns	367	379	373	385	"	"	"	
Excise Tax Returns	8	7	7	7	"	"	"	
Civilian Employment	1,512	1,617	1,608	1,633	1,760	1,846	1,929	2,003
Construction Employment	103	86	77	87	100	99	96	100
Finance, Real Estate, and Insurance Employment	95	93	93	96	99	103	107	111
Government Employment	232	246	271	289	303	322	340	355
Manufacturing Employment	187	188	176	171	171	171	170	166
Mining Employment	11	12	13	12	12	12	12	12
Services Employment	345	388	410	438	476	521	557	596
Transporation, Public Utilities Employment	72	77	81	78	78	80	81	82
Trade Employment	340	364	370	384	409	428	449	463
Personal Income ($)	49,930	56,430	62,430	71,090	82,170	93,570	107,150	120,700
Real Personal Income ('87 $)	49,760	51,490	51,890	55,750	60,770	64,980	69,400	73,110
Per Capita Personal Income ($)	14,485	15,558	16,613	18,020	19,978	21,877	24,187	26,458
Real Per Capita Personal Income ('87 $)	14,436	14,196	13,808	14,132	14,775	15,193	15,666	16,026
Population	3,447	3,627	3,758	3,945	4,113	4,277	4,430	4,562
Population Age 65 and Over	436	473	498	530	557	580	599	617

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Salt Lake City District								
Total Returns	1,043	1,086	1,160	1,229	See	Notes below		
Total Individual Returns	598	632	680	718	"	"	"	
Corporation Returns	24	25	28	29	"	"	"	
Employment Returns	157	157	159	172	"	"	"	
Excise Tax Returns	6	5	5	5	"	"	"	
Civilian Employment	709	752	765	813	891	929	964	994
Construction Employment	27	26	32	40	47	48	45	45
Finance, Real Estate, and Insurance Employment	34	33	36	40	44	45	47	48
Government Employment	141	146	154	159	166	175	182	189
Manufacturing Employment	92	103	106	108	111	109	109	108
Mining Employment	8	8	9	9	9	8	8	8
Services Employment	147	167	188	211	236	260	276	293
Transporation, Public Utilities Employment	38	41	42	46	48	49	50	51
Trade Employment	153	166	179	193	209	220	231	239
Personal Income ($)	20,060	22,580	26,260	30,500	35,530	40,380	45,660	50,590
Real Personal Income ('87 $)	19,990	20,600	21,830	23,920	26,280	28,040	29,570	30,640
Per Capita Personal Income ($)	11,948	13,212	14,811	16,354	18,239	20,000	22,026	23,863
Real Per Capita Personal Income ('87 $)	11,906	12,054	12,312	12,826	13,491	13,888	14,264	14,453
Population	1,679	1,709	1,773	1,865	1,948	2,019	2,073	2,120
Population Age 65 and Over	138	146	156	165	174	180	184	188
Wichita District								
Total Returns	2,006	2,060	2,099	2,073	See	Notes below		
Total Individual Returns	1,029	1,076	1,100	1,099	"	"	"	
Corporation Returns	36	38	39	41	"	"	"	
Employment Returns	320	318	310	318	"	"	"	
Excise Tax Returns	15	13	12	13	"	"	"	
Civilian Employment	1,205	1,233	1,238	1,276	1,332	1,363	1,398	1,433
Construction Employment	45	40	42	46	52	54	53	53
Finance, Real Estate, and Insurance Employment	57	58	58	58	61	62	64	66
Government Employment	199	209	219	233	240	251	261	270
Manufacturing Employment	176	184	184	179	178	172	171	169
Mining Employment	11	9	10	8	8	9	9	9
Services Employment	203	231	249	266	286	305	323	342
Transporation, Public Utilities Employment	63	67	65	66	67	68	68	68
Trade Employment	251	266	269	278	291	300	307	315
Personal Income ($)	37,020	40,960	45,690	50,910	57,520	63,710	71,370	78,930
Real Personal Income ('87 $)	36,900	37,370	37,980	39,930	42,540	44,240	46,230	47,810
Per Capita Personal Income ($)	15,129	16,563	18,313	20,091	22,295	24,252	26,791	29,125
Real Per Capita Personal Income ('87 $)	15,080	15,111	15,222	15,758	16,488	16,841	17,354	17,642
Population	2,447	2,473	2,495	2,534	2,580	2,627	2,664	2,710
Population Age 65 and Over	331	338	347	353	361	367	369	374
Western Region								
Total Returns	31,422	33,651	35,004	34,656	See	Notes below		
Total Individual Returns	16,629	18,113	19,110	19,103	"	"	"	
Corporation Returns	587	616	620	643	"	"	"	
Employment Returns	4,568	4,730	4,760	4,778	"	"	"	
Excise Tax Returns	146	126	123	126	"	"	"	
Civilian Employment	18,009	19,251	19,615	19,701	20,684	21,235	21,947	22,567
Construction Employment	686	813	788	742	809	856	878	884
Finance, Real Estate, and Insurance Employment	1,022	1,068	1,097	1,089	1,110	1,146	1,190	1,226
Government Employment	2,745	2,913	3,075	3,100	3,176	3,319	3,471	3,609
Manufacturing Employment	2,697	2,811	2,662	2,477	2,380	2,326	2,300	2,258
Mining Employment	61	70	71	63	60	59	59	58
Services Employment	4,032	4,473	4,817	4,939	5,206	5,625	5,980	6,308
Transporation, Public Utilities Employment	840	880	908	895	892	903	913	914
Trade Employment	3,842	4,149	4,176	4,073	4,191	4,343	4,493	4,614
Personal Income ($)	662,050	771,090	864,650	944,770	1,043,050	1,164,850	1,312,940	1,464,450
Real Personal Income ('87 $)	661,480	705,090	720,610	742,330	774,920	813,400	859,400	895,430
Per Capita Personal Income ($)	183,285	205,549	223,364	239,118	259,950	284,655	315,045	345,519
Real Per Capita Personal Income ('87 $)	182,971	187,797	185,981	187,752	192,822	198,382	205,470	210,573
Population	38,742	40,668	42,468	43,823	44,800	45,733	46,814	47,794
Population Age 65 and Over	4,222	4,437	4,604	4,787	4,923	5,022	5,114	5,213

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Anchorage District								
Total Returns	406	515	500	541	See Notes below			
Total Individual Returns	229	333	311	344	"	"	"	
Corporation Returns	9	9	9	9	"	"	"	
Employment Returns	66	64	64	67	"	"	"	
Excise Tax Returns	3	2	2	3	"	"	"	
Civilian Employment	223	236	236	248	261	268	278	284
Construction Employment	10	10	10	11	12	14	15	14
Finance, Real Estate, and Insurance Employment	11	10	11	11	11	11	12	12
Government Employment	66	69	72	74	76	78	81	83
Manufacturing Employment	13	16	18	18	17	17	17	16
Mining Employment	9	10	12	10	10	10	9	9
Services Employment	42	47	52	55	58	63	67	73
Transporation, Public Utilities Employment	18	21	22	23	23	24	24	24
Trade Employment	41	44	47	49	52	54	56	56
Personal Income ($)	9,620	10,930	12,440	13,990	15,590	17,600	20,340	22,810
Real Personal Income ('87 $)	9,590	9,970	10,340	10,970	11,530	12,220	13,180	13,820
Per Capita Personal Income ($)	17,815	19,982	21,748	23,317	25,726	28,758	32,754	36,438
Real Per Capita Personal Income ('87 $)	17,759	18,227	18,077	18,283	19,026	19,967	21,224	22,077
Population	540	547	572	600	606	612	621	626
Population Age 65 and Over	20	23	24	26	27	27	28	28
Boise District								
Total Returns	691	725	786	834	See Notes below			
Total Individual Returns	365	390	427	454	"	"	"	
Corporation Returns	14	15	16	17	"	"	"	
Employment Returns	120	121	127	137	"	"	"	
Excise Tax Returns	8	8	8	8	"	"	"	
Civilian Employment	435	464	473	492	529	547	565	581
Construction Employment	14	16	20	24	25	26	27	27
Finance, Real Estate, and Insurance Employment	19	19	21	22	23	24	26	26
Government Employment	73	78	84	89	93	98	102	106
Manufacturing Employment	54	61	63	69	69	68	68	67
Mining Employment	3	4	3	2	2	2	2	2
Services Employment	68	76	86	93	101	110	116	124
Transporation, Public Utilities Employment	18	19	20	21	21	21	22	22
Trade Employment	85	93	101	109	116	119	124	128
Personal Income ($)	12,030	14,100	16,280	18,850	21,300	24,120	27,760	31,340
Real Personal Income ('87 $)	11,990	12,860	13,530	14,780	15,750	16,750	17,980	18,980
Per Capita Personal Income ($)	12,201	14,142	15,624	17,121	18,668	20,510	23,095	25,584
Real Per Capita Personal Income ('87 $)	12,160	12,899	12,985	13,424	13,804	14,243	14,958	15,494
Population	986	997	1,042	1,101	1,141	1,176	1,202	1,225
Population Age 65 and Over	113	119	125	130	135	139	141	144
Honolulu District								
Total Returns	874	935	989	993	See Notes below			
Total Individual Returns	485	519	551	557	"	"	"	
Corporation Returns	22	23	24	25	"	"	"	
Employment Returns	121	124	127	126	"	"	"	
Excise Tax Returns	2	2	2	2	"	"	"	
Civilian Employment	494	511	546	551	582	598	618	638
Construction Employment	21	29	34	31	30	31	31	31
Finance, Real Estate, and Insurance Employment	34	35	37	38	39	40	41	43
Government Employment	96	102	109	112	113	116	121	126
Manufacturing Employment	22	21	20	18	17	17	17	16
Mining Employment	0	0	0	0	0	0	0	0
Services Employment	126	145	159	160	166	179	189	200
Transporation, Public Utilities Employment	37	40	43	42	41	42	42	42
Trade Employment	124	133	136	133	136	142	148	152
Personal Income ($)	17,180	20,530	24,150	27,100	29,950	33,660	38,190	42,900
Real Personal Income ('87 $)	17,120	18,730	20,070	21,250	22,150	23,370	24,740	25,990
Per Capita Personal Income ($)	16,071	18,715	21,221	23,083	24,834	27,299	30,166	33,179
Real Per Capita Personal Income ('87 $)	16,015	17,074	17,636	18,101	18,367	18,954	19,542	20,101
Population	1,069	1,097	1,138	1,174	1,206	1,233	1,266	1,293
Population Age 65 and Over	108	117	129	137	142	147	151	155

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Laguna Niguel District								
Total Returns	6,322	6,901	7,159	6,929	See Notes below			
Total Individual Returns	3,434	3,807	4,040	3,992	"	"	"	
Corporation Returns	118	125	119	123	"	"	"	
Employment Returns	847	897	904	882	"	"	"	
Excise Tax Returns	18	15	14	14	"	"	"	
Civilian Employment	3,331	3,634	3,709	3,670	3,816	3,932	4,083	4,223
Construction Employment	143	175	143	123	133	144	149	151
Finance, Real Estate, and Insurance Employment	170	184	189	185	187	193	202	209
Government Employment	401	437	473	471	487	514	543	569
Manufacturing Employment	444	471	444	411	394	384	380	373
Mining Employment	4	3	3	3	3	3	3	3
Services Employment	638	712	783	800	836	909	970	1,030
Transporation, Public Utilities Employment	100	104	108	109	110	112	114	115
Trade Employment	635	706	714	683	696	723	751	778
Personal Income ($)	137,800	163,200	178,820	193,910	214,460	240,250	271,910	305,300
Real Personal Income ('87 $)	137,800	149,350	149,180	152,480	159,610	168,140	178,720	187,370
Per Capita Personal Income ($)	17,242	18,972	19,685	20,741	22,508	24,649	27,096	29,716
Real Per Capita Personal Income ('87 $)	17,242	17,362	16,422	16,310	16,752	17,250	17,810	18,237
Population	7,992	8,602	9,084	9,349	9,528	9,747	10,035	10,274
Population Age 65 and Over	828	886	929	961	981	999	1,019	1,038
Las Vegas District								
Total Returns	812	920	1,048	1,109	See Notes below			
Total Individual Returns	466	535	614	647	"	"	"	
Corporation Returns	20	23	26	27	"	"	"	
Employment Returns	113	123	132	138	"	"	"	
Excise Tax Returns	6	7	8	9	"	"	"	
Civilian Employment	522	572	614	652	714	751	775	805
Construction Employment	30	45	40	46	51	42	46	44
Finance, Real Estate, and Insurance Employment	23	26	29	31	33	34	35	37
Government Employment	64	71	81	89	97	104	109	115
Manufacturing Employment	23	25	26	27	28	27	27	27
Mining Employment	8	14	13	13	12	11	12	11
Services Employment	221	251	279	291	324	345	372	396
Transporation, Public Utilities Employment	28	31	33	34	35	35	35	36
Trade Employment	102	119	128	134	144	151	157	165
Personal Income ($)	16,870	21,460	26,070	30,790	36,640	41,190	47,220	53,470
Real Personal Income ('87 $)	16,810	19,570	21,670	24,150	27,100	28,600	30,590	32,390
Per Capita Personal Income ($)	16,379	18,677	20,162	22,119	24,707	26,472	29,679	32,505
Real Per Capita Personal Income ('87 $)	16,320	17,032	16,759	17,349	18,274	18,380	19,227	19,690
Population	1,030	1,149	1,293	1,392	1,483	1,556	1,591	1,645
Population Age 65 and Over	110	125	138	155	167	176	180	186
Los Angeles District								
Total Returns	5,802	6,058	6,143	5,823	See Notes below			
Total Individual Returns	3,099	3,257	3,419	3,280	"	"	"	
Corporation Returns	132	134	129	133	"	"	"	
Employment Returns	877	918	881	864	"	"	"	
Excise Tax Returns	14	12	11	10	"	"	"	
Civilian Employment	3,990	4,138	4,033	3,891	4,015	4,062	4,168	4,268
Construction Employment	122	133	122	101	113	119	119	120
Finance, Real Estate, and Insurance Employment	269	273	266	247	248	257	267	275
Government Employment	494	521	539	533	545	562	583	603
Manufacturing Employment	887	864	775	667	628	606	593	579
Mining Employment	9	8	8	8	8	8	8	8
Services Employment	1,048	1,146	1,169	1,149	1,182	1,264	1,333	1,399
Transporation, Public Utilities Employment	205	210	210	199	198	199	200	200
Trade Employment	919	954	894	842	850	877	904	926
Personal Income ($)	134,830	153,440	166,890	175,710	187,320	206,610	229,160	252,500
Real Personal Income ('87 $)	134,830	140,410	139,220	138,160	139,420	144,600	150,630	154,970
Per Capita Personal Income ($)	18,245	20,158	21,504	22,281	23,441	25,875	28,460	30,774
Real Per Capita Personal Income ('87 $)	18,245	18,446	17,938	17,520	17,447	18,109	18,707	18,887
Population	7,390	7,612	7,761	7,886	7,991	7,985	8,052	8,205
Population Age 65 and Over	737	744	744	759	769	763	761	770

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

District and Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Portland District								
Total Returns	2,243	2,394	2,520	2,584	See Notes below			
Total Individual Returns	1,136	1,241	1,301	1,333	" " "			
Corporation Returns	43	46	52	54	" " "			
Employment Returns	349	359	365	382	" " "			
Excise Tax Returns	17	13	13	13	" " "			
Civilian Employment	1,302	1,391	1,418	1,461	1,572	1,616	1,677	1,730
Construction Employment	35	46	51	51	58	57	60	60
Finance, Real Estate, and Insurance Employment	72	76	83	89	94	97	102	106
Government Employment	206	216	226	232	239	248	257	270
Manufacturing Employment	206	218	212	208	205	204	204	200
Mining Employment	1	1	2	1	1	1	1	1
Services Employment	244	283	297	323	350	375	399	427
Transporation, Public Utilities Employment	58	63	65	65	65	66	68	68
Trade Employment	277	306	314	325	342	356	373	386
Personal Income ($)	38,430	45,320	51,470	58,480	66,500	74,470	85,240	96,920
Real Personal Income ('87 $)	38,300	41,350	42,780	45,860	49,180	51,710	55,210	58,710
Per Capita Personal Income ($)	14,197	16,180	17,597	19,243	21,151	23,171	25,901	28,785
Real Per Capita Personal Income ('87 $)	14,149	14,763	14,626	15,090	15,642	16,089	16,776	17,437
Population	2,707	2,801	2,925	3,039	3,144	3,214	3,291	3,367
Population Age 65 and Over	371	389	402	419	435	444	451	461
Sacramento District								
Total Returns	3,744	4,051	4,308	4,248	See Notes below			
Total Individual Returns	1,894	2,086	2,233	2,214	" " "			
Corporation Returns	52	55	54	56	" " "			
Employment Returns	537	554	574	568	" " "			
Excise Tax Returns	19	15	14	14	" " "			
Civilian Employment	1,776	1,937	2,055	2,115	2,229	2,303	2,402	2,476
Construction Employment	84	98	99	92	99	109	113	115
Finance, Real Estate, and Insurance Employment	99	110	119	123	127	132	138	142
Government Employment	380	406	420	422	431	448	470	489
Manufacturing Employment	164	177	173	174	172	171	171	168
Mining Employment	6	5	5	5	5	5	5	5
Services Employment	357	404	455	476	500	548	590	624
Transporation, Public Utilities Employment	85	86	90	93	92	93	95	95
Trade Employment	399	433	456	442	456	474	492	503
Personal Income ($)	77,690	91,230	103,350	112,880	125,580	140,690	160,490	180,500
Real Personal Income ('87 $)	77,690	83,490	86,220	88,760	93,460	98,460	105,490	110,780
Per Capita Personal Income ($)	17,249	19,042	20,377	21,513	23,277	25,272	27,989	30,744
Real Per Capita Personal Income ('87 $)	17,249	17,426	16,999	16,916	17,323	17,686	18,397	18,869
Population	4,504	4,791	5,072	5,247	5,395	5,567	5,734	5,871
Population Age 65 and Over	535	573	608	639	665	690	712	733
San Francisco District								
Total Returns	2,663	2,753	2,666	2,595	See Notes below			
Total Individual Returns	1,354	1,404	1,349	1,323	" " "			
Corporation Returns	44	45	43	44	" " "			
Employment Returns	376	380	370	365	" " "			
Excise Tax Returns	5	4	4	4	" " "			
Civilian Employment	1,540	1,599	1,628	1,606	1,648	1,669	1,708	1,745
Construction Employment	49	52	51	48	49	54	54	54
Finance, Real Estate, and Insurance Employment	124	123	123	121	119	120	122	123
Government Employment	239	247	251	241	239	247	257	266
Manufacturing Employment	145	153	152	147	140	136	134	131
Mining Employment	1	2	2	1	1	1	1	1
Services Employment	378	401	425	425	439	465	486	506
Transporation, Public Utilities Employment	110	111	113	107	104	105	105	104
Trade Employment	320	332	322	298	301	308	316	322
Personal Income ($)	55,290	62,460	69,110	75,020	82,010	90,810	99,410	110,130
Real Personal Income ('87 $)	55,290	57,160	57,660	58,990	61,040	63,550	65,340	67,590
Per Capita Personal Income ($)	21,282	23,605	25,797	27,520	29,963	32,795	35,189	38,400
Real Per Capita Personal Income ('87 $)	21,282	21,602	21,523	21,640	22,302	22,951	23,129	23,567
Population	2,598	2,646	2,679	2,726	2,737	2,769	2,825	2,868
Population Age 65 and Over	318	321	323	331	334	336	341	345

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 1. Return and Economic/Demographic Data by IRS Regions and Districts, 1987–2001
(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
San Jose District								
Total Returns	4,162	4,426	4,593	4,548	See	Notes below		
Total Individual Returns	2,225	2,419	2,568	2,584	"	" "		
Corporation Returns	65	66	64	66	"	" "		
Employment Returns	605	615	614	607	"	" "		
Excise Tax Returns	20	16	15	15	"	" "		
Civilian Employment	2,308	2,470	2,563	2,572	2,685	2,771	2,877	2,954
Construction Employment	89	101	100	93	101	113	118	119
Finance, Real Estate, and Insurance Employment	94	99	103	105	107	111	116	119
Government Employment	369	386	406	406	413	434	455	473
Manufacturing Employment	420	442	428	401	387	380	379	373
Mining Employment	18	19	20	16	15	15	15	15
Services Employment	489	533	579	596	630	690	740	780
Transporation, Public Utilities Employment	84	87	92	92	91	93	95	95
Trade Employment	483	527	537	513	524	545	564	578
Personal Income ($)	90,870	104,300	115,950	123,870	136,100	152,930	174,570	195,040
Real Personal Income ('87 $)	90,870	95,450	96,730	97,400	101,300	107,030	114,750	119,700
Per Capita Personal Income ($)	16,893	18,441	19,753	20,498	22,148	24,217	26,799	29,387
Real Per Capita Personal Income ('87 $)	16,893	16,876	16,479	16,118	16,485	16,949	17,616	18,035
Population	5,379	5,656	5,870	6,043	6,145	6,315	6,514	6,637
Population Age 65 and Over	544	572	592	617	634	653	672	685
Seattle District								
Total Returns	3,703	3,973	4,292	4,452	See	Notes below		
Total Individual Returns	1,943	2,122	2,297	2,374	"	" "		
Corporation Returns	69	75	84	88	"	" "		
Employment Returns	557	577	603	643	"	" "		
Excise Tax Returns	35	32	33	35	"	" "		
Civilian Employment	2,087	2,300	2,340	2,444	2,634	2,719	2,798	2,863
Construction Employment	89	107	118	123	139	148	146	149
Finance, Real Estate, and Insurance Employment	107	113	117	118	122	126	130	133
Government Employment	357	380	412	429	444	469	493	510
Manufacturing Employment	318	363	352	338	324	316	311	309
Mining Employment	3	4	4	3	3	3	3	3
Services Employment	420	475	534	571	619	676	719	749
Transporation, Public Utilities Employment	99	108	112	112	113	114	113	113
Trade Employment	458	503	527	547	575	595	608	620
Personal Income ($)	71,440	84,120	100,120	114,170	127,600	142,520	158,650	173,540
Real Personal Income ('87 $)	71,190	76,750	83,210	89,530	94,380	98,970	102,770	105,130
Per Capita Personal Income ($)	15,711	17,635	19,897	21,681	23,525	25,638	27,917	30,009
Real Per Capita Personal Income ('87 $)	15,656	16,090	16,536	17,002	17,400	17,804	18,084	18,179
Population	4,547	4,770	5,032	5,266	5,424	5,559	5,683	5,783
Population Age 65 and Over	538	568	590	613	634	648	658	668
AC (International)								
Total Returns	1,101	1,247	1,762	1,731	See	Notes below		
Total Individual Returns	531	593	1,072	1,057	"	" "		
Corporation Returns	20	24	25	28	"	" "		
Employment Returns	198	210	218	224	"	" "		
Excise Tax Returns	3	3	3	6	"	" "		
Civilian Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Construction Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Finance, Real Estate, and Insurance Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Government Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Manufacturing Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Mining Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Services Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Transporation, Public Utilities Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Trade Employment	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Personal Income ($)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Real Personal Income ('87 $)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Per Capita Personal Income ($)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Real Per Capita Personal Income ('87 $)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Population	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Population Age 65 and Over	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6149—see Table Notes for further reference.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
United States								
Total Returns	189,398	198,924	204,264	203,081	See Notes below			
Total Individual Returns	103,462	110,129	114,134	114,116	"	"	"	
Corporation Returns	4,027	4,320	4,518	4,777	"	"	"	
Employment Returns	28,165	28,823	28,465	28,869	"	"	"	
Excise Tax Returns	956	887	821	859	"	"	"	
Number of Federal Tax Deposits	72,468	79,488	82,365	88,735	100,145	107,239	114,862	121,216
Withholding / Information Documents	872,893	1,017,346	1,041,087	1,046,395	1,124,901	1,178,362	1,242,542	1,309,952
Withholding Documents	213,107	230,545	235,253	198,896	206,314	211,368	218,349	223,626
Information Documents	659,786	786,801	805,834	847,499	918,587	966,993	1,024,194	1,086,326
Civilian Employment	112,201	117,008	117,480	119,383	125,099	128,402	132,061	135,094
Construction Employment	4,829	5,020	4,572	4,527	4,996	5,207	5,286	5,315
Finance, Real Estate, and Insurance Employment	6,490	6,637	6,617	6,608	6,801	6,984	7,190	7,366
Government Employment	17,312	18,118	18,768	19,097	19,660	20,485	21,292	22,045
Manufacturing Employment	18,971	19,387	18,344	17,894	17,654	17,286	17,059	16,717
Mining Employment	708	684	686	603	589	584	577	571
Services Employment	24,168	26,807	28,198	29,666	31,803	34,228	36,258	38,031
Transporation, Public Utilities Employment	5,386	5,643	5,740	5,706	5,773	5,833	5,877	5,869
Trade Employment	24,338	25,737	25,418	25,587	26,664	27,558	28,420	29,067
Personal Income ($)	3,906,810	4,502,180	4,981,910	5,534,310	6,203,690	6,923,970	7,764,630	8,603,500
Real Personal Income ('87 $)	3,785,850	3,993,430	4,028,500	4,221,920	4,471,410	4,690,500	4,923,620	5,099,110
Per Capita Personal Income ($)	16,119	18,232	19,746	21,450	23,575	25,829	28,459	31,006
Real Per Capita Personal Income ('87 $)	15,620	16,172	15,967	16,364	16,992	17,497	18,046	18,377
Population	242,367	246,938	252,301	258,007	263,146	268,072	272,832	277,478
Population Age 65 and Over	29,719	30,826	31,785	32,797	33,647	34,248	34,658	35,199
Andover Service Center								
Total Returns	19,418	17,270	17,103	16,643	See Notes below			
Total Individual Returns	10,758	9,527	9,497	9,185	"	"	"	
Corporation Returns	388	383	382	407	"	"	"	
Employment Returns	2,426	2,477	2,339	2,298	"	"	"	
Excise Tax Returns	69	68	55	57	"	"	"	
Number of Federal Tax Deposits	8,062	5,364	6,980	6,972	0	0	0	0
Withholding / Information Documents	5,343	6,116	5,607	5,647	1,958	2,106	2,093	2,254
Withholding Documents	N.A.	5	2	3,617	0	0	0	0
Information Documents	5,343	6,111	5,605	2,030	1,958	2,106	2,093	2,254
Civilian Employment	9,444	9,715	9,532	9,636	9,934	10,124	10,375	10,565
Construction Employment	439	433	306	285	321	332	336	336
Finance, Real Estate, and Insurance Employment	598	610	589	568	576	587	599	613
Government Employment	1,414	1,466	1,465	1,445	1,477	1,522	1,570	1,615
Manufacturing Employment	1,954	1,891	1,686	1,566	1,514	1,476	1,457	1,432
Mining Employment	9	9	7	7	7	7	7	6
Services Employment	2,311	2,530	2,519	2,624	2,816	3,019	3,192	3,330
Transporation, Public Utilities Employment	383	390	381	370	373	373	374	372
Trade Employment	2,144	2,239	2,044	2,015	2,081	2,132	2,186	2,221
Personal Income ($)	343,850	400,140	425,620	465,310	520,280	578,920	648,090	714,900
Real Personal Income ('87 $)	343,010	365,430	354,160	365,190	385,580	403,010	421,740	434,860
Per Capita Personal Income ($)	133,694	152,933	161,839	176,153	194,678	214,548	237,773	259,405
Real Per Capita Personal Income ('87 $)	133,348	139,634	134,621	138,216	144,214	149,274	154,550	157,632
Population	19,751	20,068	20,174	20,274	20,479	20,669	20,913	21,162
Population Age 65 and Over	2,626	2,698	2,727	2,786	2,831	2,857	2,876	2,908

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6186—see Table Notes Section for further reference.
Volumes of Federal Tax Deposits and Withholding/Information Documents are reported by processing site and reflect impact of new "SCRIPS" alignment effective in 1995.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Brookhaven Service Center								
Total Returns	16,897	17,429	17,095	16,454	See Notes below			
Total Individual Returns	8,573	8,976	8,814	8,565	"	" "		
Corporation Returns	537	567	574	615	"	" "		
Employment Returns	2,593	2,663	2,550	2,532	"	" "		
Excise Tax Returns	40	48	34	36	"	" "		
Number of Federal Tax Deposits	7,084	7,194	7,039	7,741	0	0	0	0
Withholding / Information Documents	7,148	5,917	6,738	6,902	3,242	3,373	3,372	3,551
Withholding Documents	N.A.	5	0	1	0	0	0	0
Information Documents	7,148	5,912	6,738	6,901	3,242	3,373	3,372	3,551
Civilian Employment	9,040	9,079	8,831	8,649	8,921	9,079	9,277	9,442
Construction Employment	373	372	289	236	251	256	259	261
Finance, Real Estate, and Insurance Employment	885	889	837	812	829	844	864	881
Government Employment	1,379	1,423	1,419	1,399	1,430	1,476	1,518	1,556
Manufacturing Employment	1,307	1,235	1,069	977	952	932	918	899
Mining Employment	4	4	3	3	3	2	2	2
Services Employment	2,410	2,559	2,519	2,548	2,698	2,857	2,987	3,116
Transporation, Public Utilities Employment	527	531	526	500	498	497	497	494
Trade Employment	1,914	1,934	1,774	1,705	1,750	1,788	1,827	1,854
Personal Income ($)	378,800	442,030	477,320	520,620	580,490	641,880	711,980	782,930
Real Personal Income ('87 $)	378,250	404,030	397,590	408,910	430,880	447,720	465,040	477,810
Per Capita Personal Income ($)	61,620	71,779	77,610	83,455	92,491	101,686	111,571	121,581
Real Per Capita Personal Income ('87 $)	61,548	65,624	64,666	65,564	68,692	70,978	72,973	74,291
Population	18,774	18,822	18,862	19,050	19,161	19,274	19,424	19,600
Population Age 65 and Over	2,421	2,447	2,468	2,508	2,532	2,538	2,540	2,554
Philadelphia Service Center								
Total Returns	15,175	20,707	21,465	21,448	See Notes below			
Total Individual Returns	8,413	11,688	12,409	12,277	"	" "		
Corporation Returns	302	400	430	456	"	" "		
Employment Returns	2,681	2,889	2,873	2,903	"	" "		
Excise Tax Returns	81	77	75	75	"	" "		
Number of Federal Tax Deposits	5,177	7,756	7,762	8,444	0	0	0	0
Withholding / Information Documents	5,653	6,416	7,186	5,014	3,017	3,020	2,997	3,195
Withholding Documents	N.A.	20	1	2	0	0	0	0
Information Documents	5,653	6,396	7,185	5,012	3,017	3,020	2,997	3,195
Civilian Employment	11,119	11,675	11,513	11,695	12,111	12,417	12,742	13,019
Construction Employment	588	626	517	482	520	537	545	548
Finance, Real Estate, and Insurance Employment	623	644	650	645	659	677	696	710
Government Employment	1,926	1,993	2,025	2,046	2,068	2,118	2,186	2,249
Manufacturing Employment	1,764	1,770	1,656	1,586	1,553	1,513	1,494	1,466
Mining Employment	48	44	40	35	33	32	31	30
Services Employment	2,735	3,031	3,144	3,272	3,499	3,766	3,979	4,154
Transporation, Public Utilities Employment	520	543	549	545	552	557	558	555
Trade Employment	2,379	2,511	2,433	2,424	2,522	2,598	2,676	2,728
Personal Income ($)	387,460	450,490	497,440	548,890	613,070	683,150	763,260	841,690
Real Personal Income ('87 $)	386,730	411,610	414,160	430,960	454,740	476,090	497,690	512,860
Per Capita Personal Income ($)	16,441	18,794	20,424	22,176	24,353	26,727	29,423	31,960
Real Per Capita Personal Income ('87 $)	16,410	17,172	17,004	17,411	18,064	18,626	19,185	19,474
Population	23,567	23,970	24,356	24,752	25,174	25,560	25,941	26,336
Population Age 65 and Over	3,010	3,118	3,221	3,326	3,404	3,453	3,484	3,534

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6186—see Table Notes Section for further reference.
Volumes of Federal Tax Deposits and Withholding/Information Documents are reported by processing site and reflect impact of new "SCRIPS" alignment effective in 1995.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Atlanta Service Center								
Total Returns	21,550	18,804	19,587	19,766	See Notes below			
Total Individual Returns	11,631	9,949	10,520	10,669	"	"		
Corporation Returns	515	520	570	610	"	"		
Employment Returns	2,771	2,762	2,736	2,825	"	"		
Excise Tax Returns	67	62	56	63	"	"		
Number of Federal Tax Deposits	7,894	8,260	7,462	8,124	0	0	0	0
Withholding / Information Documents	7,007	6,603	6,210	7,230	2,298	2,475	2,523	2,718
Withholding Documents	N.A.	3	0	4,667	0	0	0	0
Information Documents	7,007	6,600	6,210	2,563	2,298	2,475	2,523	2,718
Civilian Employment	9,979	10,476	10,643	10,948	11,603	12,040	12,494	12,903
Construction Employment	580	579	490	489	550	581	599	609
Finance, Real Estate, and Insurance Employment	578	601	587	584	610	626	647	670
Government Employment	1,466	1,585	1,682	1,723	1,796	1,888	1,981	2,076
Manufacturing Employment	1,476	1,496	1,403	1,395	1,388	1,369	1,347	1,318
Mining Employment	19	20	18	16	16	16	15	15
Services Employment	2,085	2,390	2,558	2,778	3,043	3,318	3,560	3,773
Transporation, Public Utilities Employment	489	519	535	545	556	565	574	578
Trade Employment	2,327	2,511	2,473	2,568	2,719	2,836	2,942	3,035
Personal Income ($)	320,050	378,500	424,110	478,430	547,000	619,210	707,020	796,610
Real Personal Income ('87 $)	319,580	345,980	353,280	375,780	406,070	431,990	462,040	486,410
Per Capita Personal Income ($)	58,616	66,381	71,646	78,180	86,296	94,809	105,322	115,399
Real Per Capita Personal Income ('87 $)	58,520	60,670	59,668	61,397	64,040	66,112	68,764	70,401
Population	21,639	22,576	23,509	24,292	25,104	25,848	26,539	27,260
Population Age 65 and Over	3,128	3,317	3,509	3,663	3,819	3,942	4,038	4,151
Memphis Service Center								
Total Returns	17,849	17,460	18,011	18,049	See Notes below			
Total Individual Returns	10,435	10,169	10,552	10,732	"	"		
Corporation Returns	303	333	351	367	"	"		
Employment Returns	2,675	2,659	2,609	2,648	"	"		
Excise Tax Returns	109	98	90	97	"	"		
Number of Federal Tax Deposits	6,547	7,352	7,220	7,822	0	0	0	0
Withholding / Information Documents	5,685	5,944	6,089	6,734	12,213	11,384	11,429	11,602
Withholding Documents	N.A.	1	2	5	12	9	11	12
Information Documents	5,685	5,943	6,087	6,729	12,201	11,375	11,418	11,590
Civilian Employment	10,803	11,170	11,231	11,468	12,038	12,363	12,692	12,944
Construction Employment	479	490	479	492	538	568	574	572
Finance, Real Estate, and Insurance Employment	459	465	464	471	488	501	518	531
Government Employment	1,714	1,809	1,887	1,943	2,024	2,121	2,207	2,284
Manufacturing Employment	2,335	2,432	2,375	2,421	2,417	2,388	2,352	2,297
Mining Employment	88	87	88	71	70	70	69	69
Services Employment	1,786	2,017	2,178	2,387	2,576	2,789	2,968	3,109
Transporation, Public Utilities Employment	516	556	565	566	575	581	587	586
Trade Employment	2,188	2,336	2,348	2,431	2,543	2,636	2,725	2,789
Personal Income ($)	305,480	349,840	394,090	448,970	506,350	567,880	638,270	705,670
Real Personal Income ('87 $)	304,470	319,230	327,550	352,100	374,510	394,350	413,470	427,480
Per Capita Personal Income ($)	73,031	83,010	92,153	102,651	113,682	125,045	138,348	150,627
Real Per Capita Personal Income ('87 $)	72,794	75,748	76,593	80,504	84,083	86,835	89,623	91,247
Population	24,484	24,634	25,036	25,630	26,156	26,678	27,116	27,521
Population Age 65 and Over	2,958	3,064	3,143	3,245	3,331	3,397	3,432	3,477

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6186—see Table Notes Section for further reference.
Volumes of Federal Tax Deposits and Withholding/Information Documents are reported by processing site and reflect impact of new "SCRIPS" alignment effective in 1995.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Cincinnati Service Center								
Total Returns	18,211	22,951	23,602	23,476	See Notes below			
Total Individual Returns	10,501	13,542	13,945	13,909	"	"	"	
Corporation Returns	380	448	479	507	"	"	"	
Employment Returns	2,996	3,170	3,141	3,185	"	"	"	
Excise Tax Returns	116	107	101	105	"	"	"	
Number of Federal Tax Deposits	7,038	7,742	9,331	9,372	20,336	25,469	27,406	29,018
Withholding / Information Documents	4,038	7,031	8,415	10,243	15,390	14,929	14,935	15,385
Withholding Documents	N.A.	2	2	9	12	15	18	21
Information Documents	4,038	7,029	8,413	10,234	15,378	14,914	14,917	15,434
Civilian Employment	13,648	14,339	14,291	14,629	15,268	15,586	15,925	16,161
Construction Employment	484	536	513	530	582	603	610	609
Finance, Real Estate, and Insurance Employment	623	645	657	665	684	702	719	732
Government Employment	2,014	2,075	2,138	2,175	2,241	2,328	2,405	2,480
Manufacturing Employment	3,036	3,111	2,946	2,948	2,912	2,839	2,795	2,736
Mining Employment	114	104	99	83	77	75	73	72
Services Employment	2,731	3,012	3,171	3,359	3,589	3,840	4,050	4,227
Transporation, Public Utilities Employment	585	615	616	615	628	634	637	633
Trade Employment	2,961	3,165	3,178	3,214	3,348	3,448	3,539	3,600
Personal Income ($)	559,510	637,340	697,730	775,610	865,350	955,730	1,060,610	1,163,680
Real Personal Income ('87 $)	444,490	461,950	461,300	485,360	511,380	530,710	550,810	564,270
Per Capita Personal Income ($)	103,566	117,329	127,754	140,110	153,880	168,202	184,919	200,633
Real Per Capita Personal Income ('87 $)	82,554	85,423	85,053	88,394	91,820	94,451	97,211	98,581
Population	30,955	31,093	31,457	31,913	32,373	32,732	33,052	33,428
Population Age 65 and Over	3,773	3,902	4,018	4,141	4,226	4,270	4,288	4,332
Kansas City Service Center								
Total Returns	18,870	22,871	23,534	23,291	See Notes below			
Total Individual Returns	10,252	12,761	13,140	13,114	"	"	"	
Corporation Returns	393	463	491	518	"	"	"	
Employment Returns	3,090	3,259	3,279	3,352	"	"	"	
Excise Tax Returns	146	142	136	143	"	"	"	
Number of Federal Tax Deposits	7,303	8,630	9,241	10,097	21,170	26,191	28,021	29,514
Withholding / Information Documents	7,230	9,135	13,149	10,626	15,038	16,537	16,589	16,886
Withholding Documents	N.A.	3	2	7	18	28	31	35
Information Documents	7,230	9,132	13,147	10,619	15,020	16,509	16,558	16,851
Civilian Employment	13,519	14,110	14,215	14,504	15,241	15,604	15,965	16,276
Construction Employment	483	510	502	522	586	608	607	612
Finance, Real Estate, and Insurance Employment	791	815	837	856	887	910	931	949
Government Employment	1,916	1,983	2,049	2,083	2,161	2,254	2,337	2,415
Manufacturing Employment	2,482	2,620	2,529	2,509	2,507	2,455	2,422	2,369
Mining Employment	39	37	35	32	29	29	28	28
Services Employment	2,860	3,177	3,357	3,546	3,811	4,070	4,279	4,471
Transporation, Public Utilities Employment	686	720	729	728	737	744	748	746
Trade Employment	3,026	3,186	3,174	3,204	3,351	3,449	3,539	3,611
Personal Income ($)	443,920	506,240	558,330	621,540	699,780	776,830	864,440	953,180
Real Personal Income ('87 $)	443,070	462,510	464,800	487,980	518,930	541,230	563,420	580,590
Per Capita Personal Income ($)	91,432	103,056	112,218	123,144	136,403	149,025	163,742	177,914
Real Per Capita Personal Income ('87 $)	91,231	94,132	93,392	96,661	101,101	103,766	106,604	108,262
Population	28,233	28,479	28,858	29,314	29,833	30,317	30,730	31,176
Population Age 65 and Over	3,657	3,733	3,820	3,897	3,983	4,040	4,068	4,117

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
Return projections are presented in IRS Document 6186—see Table Notes Section for further reference.
Volumes of Federal Tax Deposits and Withholding/Information Documents are reported by processing site and reflect impact of new "SCRIPS" alignment effective in 1995.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Austin Service Center								
Total Returns	20,309	17,902	18,553	18,609	See Notes below			
Total Individual Returns	11,098	9,948	10,433	10,651	"	"	"	
Corporation Returns	401	355	373	390	"	"	"	
Employment Returns	2,800	2,643	2,613	2,706	"	"	"	
Excise Tax Returns	107	83	80	85	"	"	"	
Number of Federal Tax Deposits	7,607	7,587	7,052	7,882	21,994	28,085	29,740	31,136
Withholding / Information Documents	6,353	8,652	8,800	8,122	14,201	14,779	14,853	15,117
Withholding Documents	N.A.	4	0	0	14	17	20	23
Information Documents	6,353	8,648	8,800	8,122	14,187	14,762	14,833	15,094
Civilian Employment	10,833	11,173	11,478	11,888	12,590	13,011	13,451	13,813
Construction Employment	454	423	441	462	526	543	558	563
Finance, Real Estate, and Insurance Employment	590	580	575	577	599	621	644	661
Government Employment	1,723	1,815	1,918	2,028	2,089	2,201	2,303	2,397
Manufacturing Employment	1,295	1,361	1,366	1,360	1,371	1,339	1,328	1,306
Mining Employment	253	239	251	226	226	228	226	225
Services Employment	2,011	2,269	2,471	2,635	2,851	3,088	3,286	3,452
Transporation, Public Utilities Employment	536	566	597	603	615	625	632	633
Trade Employment	2,293	2,366	2,428	2,500	2,616	2,721	2,816	2,890
Personal Income ($)	327,300	366,730	416,020	472,080	534,320	603,790	680,520	759,590
Real Personal Income ('87 $)	326,990	335,310	346,700	370,920	396,960	421,640	445,490	464,510
Per Capita Personal Income ($)	82,026	91,258	100,918	110,627	122,508	134,083	147,522	161,319
Real Per Capita Personal Income ('87 $)	81,896	83,392	84,041	86,874	90,896	93,482	96,280	98,384
Population	23,632	23,837	24,471	25,304	25,940	26,710	27,372	27,953
Population Age 65 and Over	2,504	2,613	2,701	2,799	2,887	2,968	3,022	3,082
Ogden Service Center								
Total Returns	21,142	22,614	23,865	24,590	See Notes below			
Total Individual Returns	11,204	12,162	12,898	13,279	"	"	"	
Corporation Returns	429	456	489	514	"	"	"	
Employment Returns	3,308	3,367	3,429	3,574	"	"	"	
Excise Tax Returns	163	154	147	155	"	"	"	
Number of Federal Tax Deposits	6,983	8,457	8,442	9,379	21,666	27,494	29,695	31,548
Withholding / Information Documents	9,576	11,938	12,936	13,189	16,910	16,785	16,913	17,315
Withholding Documents	N.A.	14	17	37	48	54	62	71
Information Documents	9,576	11,924	12,919	13,152	16,862	16,731	16,851	17,244
Civilian Employment	12,152	12,922	13,267	13,678	14,648	15,147	15,689	16,144
Construction Employment	524	559	587	634	697	717	726	731
Finance, Real Estate, and Insurance Employment	655	673	703	735	767	793	824	850
Government Employment	2,161	2,275	2,407	2,491	2,578	2,703	2,825	2,936
Manufacturing Employment	1,406	1,519	1,494	1,490	1,473	1,454	1,443	1,420
Mining Employment	103	109	111	103	100	99	99	98
Services Employment	2,561	2,886	3,165	3,388	3,668	3,973	4,239	4,485
Transporation, Public Utilities Employment	608	650	676	686	696	706	715	717
Trade Employment	2,625	2,839	2,963	3,058	3,225	3,355	3,487	3,584
Personal Income ($)	404,470	466,940	536,330	607,250	687,210	772,320	877,200	979,380
Real Personal Income ('87 $)	403,350	426,280	446,100	476,440	508,840	537,070	569,740	594,700
Per Capita Personal Income ($)	201,858	225,599	250,293	272,787	299,784	328,599	365,766	400,166
Real Per Capita Personal Income ('87 $)	201,221	205,878	208,105	213,963	221,828	228,311	237,204	242,632
Population	26,904	27,846	29,046	30,300	31,319	32,235	33,053	33,765
Population Age 65 and Over	3,107	3,294	3,461	3,627	3,774	3,885	3,966	4,051

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
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Volumes of Federal Tax Deposits and Withholding/Information Documents are reported by processing site and reflect impact of new "SCRIPS" alignment effective in 1995.

Table 2. Returns, FTDs, Withholding/Information Documents, and Economic/Demographic Data for the United States and IRS Service Centers, 1987–2001

(total dollar amounts in millions; per capita dollar amounts in units; other amounts in thousands)

Item	Actual				Projected			
	1987	1989	1991	1993	1995	1997	1999	2001
Fresno Service Center								
Total Returns	19,978	20,987	21,450	20,756	See Notes below			
Total Individual Returns	10,597	11,406	11,928	11,737	"	" "		
Corporation Returns	380	393	379	392	"	" "		
Employment Returns	2,825	2,933	2,896	2,844	"	" "		
Excise Tax Returns	58	48	45	44	"	" "		
Number of Federal Tax Deposits	8,769	11,146	11,835	12,901	0	0	0	0
Withholding / Information Documents	10,066	9,092	9,478	6,897	2,107	2,299	2,244	2,443
Withholding Documents	N.A.	2	1	2	0	0	0	0
Information Documents	10,066	9,090	9,477	6,895	2,107	2,299	2,244	2,443
Civilian Employment	11,664	12,351	12,479	12,289	12,746	13,032	13,453	13,828
Construction Employment	424	491	449	395	425	460	471	475
Finance, Real Estate, and Insurance Employment	690	714	718	695	700	722	748	770
Government Employment	1,599	1,694	1,779	1,764	1,797	1,874	1,959	2,037
Manufacturing Employment	1,918	1,951	1,819	1,643	1,566	1,523	1,503	1,472
Mining Employment	31	32	32	28	27	27	27	27
Services Employment	2,679	2,937	3,115	3,130	3,253	3,508	3,717	3,915
Transporation, Public Utilities Employment	535	552	567	548	543	550	556	556
Trade Employment	2,480	2,651	2,603	2,468	2,506	2,595	2,683	2,756
Personal Income ($)	435,970	503,930	554,920	595,610	649,840	724,260	813,240	905,870
Real Personal Income ('87 $)	435,910	461,100	462,860	468,280	483,520	506,690	534,180	555,620
Per Capita Personal Income ($)	89,733	99,891	107,960	114,124	122,895	134,835	147,711	161,455
Real Per Capita Personal Income ('87 $)	89,677	91,360	89,999	89,688	91,352	94,212	96,804	98,827
Population	24,428	25,613	26,532	27,178	27,607	28,049	28,692	29,277
Population Age 65 and Over	2,535	2,640	2,717	2,805	2,860	2,898	2,944	2,993

Notes: Actual return volumes are reported by location of taxpayer, not by processing site.
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